

Dec 16 '54

CHILD DEVELOPMENT

Vol. 25
June, 1954
No. 2

Published Quarterly by
CHILD DEVELOPMENT PUBLICATIONS
OF THE

SOCIETY FOR RESEARCH IN CHILD DEVELOPMENT, INC.

Contents for June

Organismic Growth: P-Technique in the Analysis of Longitudinal Growth Data <i>Fred T. Tyler</i>	83
Attitudes of Grandmothers and Mothers Toward Child Rearing Practices <i>Ruth Staples and June Warden Smith</i>	91
Concept of Mother—A Study of Four- and Five-Year-Old Children <i>Sina M. Mott</i>	99
Color Usage in Nursery School Painting <i>Ambrose L. Corcoran</i>	107
Wild Children and the Principle of Reinforcement <i>Marian W. Smith</i>	115
Possible Causes of Overdependency in Young Children <i>Celia Burns Stendler</i>	125
The Adjustment of Two-Year-Olds in a Novel Social Situation <i>Glen Heathers</i>	147

Information for Contributors and Subscribers

Child Development, one of three publications issued by the Society for Research in Child Development, Inc., is issued quarterly in March, June, September and December. The subscription price is \$6.00 per year, postpaid.

Child Development Abstracts and Bibliography is now in its twenty-seventh volume. This publication is issued February through December—six numbers to a volume. The subscription price is \$5.00 per year, postpaid.

Monographs of the Society for Research in Child Development, Inc., issued irregularly during the year, consists primarily of detailed critical reviews and seriatim studies. The subscription price is \$4.00 per yearly volume.

The three publications of the Society are available at the special price of \$12.00 per year.

A limited number of back issues of all publications is available at reduced prices. A mimeographed list may be had upon request.

Contributors are asked to refer to the *Publication Manual of the American Psychological Association* (Supplement to the *Psychological Bulletin*, 1952, 49, No. 4, Part 2) and *A Manual of Style* (University of Chicago Press, 1950) in the preparation of manuscripts.

Manuscripts and all business correspondence relating to the publications should be addressed to Child Development Publications, 1341 Euclid, University of Illinois, Champaign, Illinois.

CHILD DEVELOPMENT

Vol. 25

June, 1954

No. 2

Editorial Board

T. W. RICHARDS, *Editor*

*Associate Professor of Neuropsychiatry
School of Medicine
and Professor of Psychology
Louisiana State University*

HAROLD E. JONES

*Director, Institute of Child Welfare
and Professor of Psychology
University of California*

V. O. HURME

*Director of Clinical Research
Forsyth Dental Infirmary*

Published Quarterly by

CHILD DEVELOPMENT PUBLICATIONS

(of The Society for Research in Child Development, Inc.)

1341 Euclid

University of Illinois
Champaign, Illinois

Made in United States of America

Printed by
THE ANTIOCH PRESS
Yellow Springs, Ohio

ORGANISMIC GROWTH: P-TECHNIQUE IN THE ANALYSIS OF LONGITUDINAL GROWTH DATA

FRED T. TYLER

University of California

Considerable educational and psychological significance has recently been attached to certain organismic concepts, such as "unity of growth" and "interrelatedness of the growth processes." These principles refer to the nature of growth within the individual, and consequently are to be validated primarily by studies of individual growth rather than from analyses of group data. This paper is concerned with the use of the *P*-technique (4) for studying the interrelatedness of rates of growth among physical characteristics during adolescence.

Our knowledge about intra-individual growth is meager compared with what is known about inter-individual growth. There are, of course, several reasons for this condition. First, investigations into the nature of growth within the individual are contingent upon evidence from longitudinal studies, and many types of data have only relatively recently become available from various growth studies, such as those at the Institute of Child Welfare, University of California.

It is true that certain selected data on the subjects in the Harvard Growth Study were published as early as 1938. The subjects were approximately 7 to 17 years of age. As many as thirteen sets of annual measurements of a limited number of physical and psychological characteristics were reported for only 47 of 747 boys and 27 of 806 girls. Apparently requisite data for the study of the growth of individual children have been, and indeed still are, relatively scarce.

Second, statistical methods for analyzing many features of longitudinal data have not been extensively investigated. For certain studies of the nature of intra-individual growth univariate analysis is appropriate, and has been the commonest method of studying the individual.

Graphical analysis is adaptable to the study of intra-individual differences in physical growth and psychological changes. That such a procedure provides a useful approach may be seen from the recent description of somatic development in adolescent boys by Stolz and Stolz (8). However, graphical comparisons become cumbersome when many measures of several physical and psychological characteristics of an individual are to be considered simultaneously. It is relatively easy to ascertain the relationships between certain features of the growth curves for, say, height and stem lengths, but

CHILD DEVELOPMENT

it is more difficult when curves of, say, five measures of skeletal growth are to be compared. For some problems, the analysis of numerous measures of growth might be more rewarding if it could be based upon some numerical index of relationship, such as coefficients of correlation and factor loadings, rather than upon a visual inspection of several growth curves.

Traditionally, coefficients of correlation have been computed between scores or measures obtained from a sampling of individuals; the method has been designated as the *R*-technique. The possibility of correlating persons (*Q*-technique) for a sampling of tests has been discussed by such writers as Burt (1), Stephenson (7), and Cattell (4), who have also considered other methods that have been labeled *P*- and *O*-techniques. Cattell

TABLE I
COMPARISON OF *R*- AND *P*-TECHNIQUES

R-TECHNIQUE			P-TECHNIQUE		
Subjects	<i>Measures</i>		Ages	<i>Measures</i>	
	(rate of increment per annum)			(rate of increment per annum)	
	Ht	Wt		Ht	Wt
A	63	53	10.5	63	53
B	49	13	11.0	30	3
C	72	43	11.5	80	34
D	83	27	12.0	52	62

has discussed the *P*-technique in its application to longitudinal data (4), and has illustrated the procedure in a study of personality characteristics of a single college student over a period of time (3). This particular technique appears to be useful for the study of the relationships among measures of growth within the individual. In *P*-technique, correlations are based upon measures from a sampling of ages rather than of individuals.

The difference between *P*- and *R*-techniques may be seen by reference to Table 1. In *R*-technique the numerator of the coefficient of correlation is the product of the measures of height (Ht) and weight (Wt) summed over the subjects in the sample, whereas in *P*-technique the numerator is the product of the same measures summed over the ages.

Units of Measurement

Many statements about the "unity of growth" or about relationships among the growth processes are in reality somewhat ambiguous. The term growth may refer to measures of *status* in some characteristic, or to measures of *increment* during a given time, that is, to *rate* of change in status. The usual tendency is for measures of physical status to increase from age to age during childhood and adolescence; it is, for example, almost certain

FRED T. TYLER

that height will be greater at an older than at a younger age. Weight also tends to increase with age, during the growth period, although there may be rather marked irregularities in increments in weight during successive intervals of time, and an individual may show an actual decrease in body weight from an earlier to a later age.

Correlations (*P*-technique) between measures of status for those characteristics that increase with age will tend to approximate unity, even though the rates of change may vary considerably from period to period. It seems appropriate, therefore, to inquire into the nature of the relationship among the *rates* of growth in various physical or psychological characteristics. Shuttleworth (5) observed that little attention had been paid to the developmental features of longitudinal data, and remarked further that the emphasis in the analysis of such data should stress growth increments rather than gross dimensions. Stolz and Stolz (8) also believed that they would obtain more useful information from studies of velocity as compared with measures of status.

An example of longitudinal data for the study of intra-individual growth by the *P*-technique is presented in Table 2. Measures of status in height and weight are in columns 2 and 3, and measures of rate of growth are in columns 7 and 8.

TABLE 2
DATA FOR CALCULATING *r* AND *rho*, *P*-TECHNIQUE

1	2	3	4	5	6	7	8	9	10
T								Rank Order	
(CA)	Wt	Ht	ΔT	ΔWt	ΔHt	$\Delta Wt/\Delta T$	$\Delta Ht/\Delta T$	$\Delta Wt/\Delta T$	$\Delta Ht/\Delta T$
10.9	276	1313							
11.6	294	1332	.7	18	19	26	27	10	10
11.9	307	1350	.3	13	18	43	60	8	6
12.5	321	1382	.6	14	32	23	53	11	7
13.0	344	1402	.5	23	20	46	40	7	8
13.5	385	1445	.5	41	43	82	86	2	2
14.0	415	1485	.5	30	40	60	80	4	3
14.5	451	1535	.5	36	50	72	100	3	1
15.0	550	1571	.5	99	36	198	72	1	4
15.5	514	1588	.5	-36	17	-72	34	14	9
15.9	533	1614	.4	19	26	48	65	6	5
16.5	566	1618	.6	33	4	55	7	5	14
17.0	566	1623	.5	0	5	0	10	13	12
17.5	575	1631	.5	9	8	18	16	12	11
18.0	589	1635	.5	14	4	28	8	9	13

CHILD DEVELOPMENT

Two steps were involved in the calculation of the figures of column 7. The difference between the subject's weights at each two successive ages was determined (ΔWt —column 5), and was divided by the intervals between the two corresponding ages (ΔT —column 4). The quotient ($\Delta Wt/\Delta T$ —column 7) is the computed annual rate of growth at the mid-point of the interval for which the increment in weight was determined. It should be observed that linearity of the growth curve between successive measurements was assumed for these calculations. This assumption should not be too seriously in error since the intervals tended to be of short duration, approximately six months. Data for height are in columns 3, 6 and 8.

Coefficients of correlation may be computed between the data of columns 2 and 3, or of 7 and 8. The former shows the relationship between measures of height and weight for the sampling of ages in column 1, and the latter, the relationship between estimates of the annual rate of change for the sampling of ages (the midpoints of successive intervals over which the gains were determined).

The Coefficient of Correlation

The determination of a measure of relationship for longitudinal growth data requires another decision relative to the method of computing the coefficient. Pearson's product-moment coefficient of correlation is the most reliable measure of relationship. However, it may often happen that only a small sample of ages within the individual are available. Some other measure might be appropriate, as for instance Spearman's ρ , or tetrachoric r for which the dichotomy is at the median measure. For comparative purposes, Pearsonian coefficients were computed from columns 7 and 8, and ρ 's from columns 9 and 10 wherein the estimated annual rates of change of columns 7 and 8 were ranked. The ages do not constitute random samples since the examinations were held at fairly regular intervals during adolescence (7). Furthermore, increments may not be normally distributed (9).

Factor Analysis

The nature of a factor analysis of correlations among rates of physical growth will be illustrated from the data of one member of the Adolescent Growth Study. The twelve physical measures that were selected, namely, weight, chest depth, and thigh, arm, chest and leg circumference; height, stem length, and biacromial and bi-iliac width; and strength of grip of the right and left hands may be grouped into three large categories, namely, ponderal (body size), skeletal, and strength. Pearsonian r 's among these twelve measures were computed from data arranged as in columns 7 and 8 of Table 2, while ρ 's were obtained after arranging the data as in columns 9 and 10. The two sets of intercorrelations are in Table 3, ρ 's being above, and r 's below the diagonal.

FRED T. TYLER

TABLE 3
CORRELATIONS AMONG TWELVE PHYSICAL MEASURES
with ρ above and r below the diagonal*

	Wt	TC	AC	CC	LC	CD	Ht	SL	BA	BI	RB	LG
Wt	52	53	13	53	—06	65	47	76	—14	17	19
TC	42	92	39	50	—27	24	—09	25	37	—11	12
AC	56	81	46	62	—08	32	—11	26	50	—05	14
CC	01	30	52	16	12	46	01	03	61	—35	—22
LC	52	30	52	18	38	32	02	50	14	12	—09
CD	—15	—51	—19	11	39	13	—07	27	36	15	—02
Ht	50	11	36	41	21	09	74	54	29	11	12
SL	50	04	08	03	07	—12	74	46	—07	31	15
BA	45	03	28	13	40	25	54	56	02	45	49
BI	—11	47	50	63	14	24	27	00	03	—01	25
RG	22	—03	10	—32	09	06	15	22	36	03	70
LG	—10	06	15	—21	—13	05	—01	34	24	77	

* See Table 4 for abbreviations.

The first factor for each matrix was next extracted by means of Thurstone's complete centroid method. Typically, the diagonal entry in this method is the value of the largest coefficient of correlation in the column. However, other values may be used, such as unity or the reliability coefficient. The matrices obtained by both r and ρ were factored twice, first using the largest correlation and then unity as the diagonal entry. It was believed that use of the latter would tend to maximize the variance related to the common factor, and thus facilitate the appearance of a common factor if one should exist in these particular measures.

It is at once apparent that there is a marked similarity among the four sets of factor loadings reported in Table 4. There is no generally accepted method of determining the significance of a factor loading. However, since loadings are in the nature of coefficients of correlation it has been suggested (2) that their significance can be approximated by treating them as coefficients of correlation. For 12 degrees of freedom Pearsonian r must be .55 to be significant at the .05 level. Accepting this criterion it is seen that the interpretation is the same for the two analyses of the ρ 's. There are two minor differences between the results of the analyses of Pearson r 's, one loading changing from .54 to .59, and one from .52 to .55. The interpretation of the analysis of the ρ 's is really very similar to that from the factorization of the product-moment correlations.

If the first factor is a general factor, then we should expect that each of the physical growth characteristics considered in Table 2 would have

CHILD DEVELOPMENT

TABLE 4
COMPARISON OF FIRST FACTOR LOADINGS FROM
EACH OF FOUR METHODS

	Spearman's ρ		Pearson's r	
	Diagonal Entry r	Diagonal Entry 1.00	Diagonal Entry r	Diagonal Entry 1.00
Weight (Wt)	72	72	57	61
Thigh Circumference ... (TC)	60	58	47	48
Arm Circumference (AC)	70	68	76	75
Chest Circumference ... (CC)	36	43	41	44
Leg Circumference (LC)	61	64	54	59
Chest Depth (CD)	20	29	12	19
Height (Ht)	74	75	70	71
Stem Length (SL)	41	43	48	50
Biacromial (BA)	76	76	66	70
Bi-iliac (BI)	46	50	52	55
Right Grip (RG)	35	38	41	42
Left Grip (LG)	40	43	33	35

a significant loading on that factor. Although all the loadings are positive, only six of the twelve are significant. Four of these (weight, and thigh, arm, and leg circumference) are related to tissue mass; the other two (height and biacromial diameter) are skeletal. It is concluded that within this particular subject there is not a general factor, or a high degree of unity, in the rates of growth of the twelve characteristics listed in Table 4. This conclusion is probably all the more significant when it is remembered that the correlations were based upon measures obtained during adolescence. At the end of this period we could expect to find little increase in many of the characteristics so that they would have similar rank orders simply by reason of the fact that the boy was approaching adult status in many of these characteristics, especially those of a skeletal nature. This might be somewhat less true in the case of ponderal characteristics.

Second and Third Factors

Three factors were extracted from the matrix of ρ 's; the largest correlation in the column was used as the diagonal entry. The loadings are presented in Table 5.

There is a tendency for both the second and third factors to be bipolar. However, only one loading in each of these factors exceeds the value of .55

FRED T. TYLER

TABLE 5

FIRST THREE FACTORS FROM ρ 's WITH THE LARGEST
COLUMNAR CORRELATION AS THE DIAGONAL ENTRY

	I	II	III
Wt	72	-28	-50
TC	60	43	-48
AC	70	54	-35
CC	36	51	25
LC	61	28	-33
CD	20	13	32
Ht	74	-22	21
SL	41	-59	19
BA	76	-40	-14
BI	46	52	58
RG	35	-52	18
LG	40	-41	14

which has been proposed as the lower limit for significance. Such trend as there is seems to signify that the second factor might be regarded as one of width as contrasted to one of height.

SUMMARY AND CONCLUDING REMARKS

The correlations (*P*-technique) among the estimated rates of growth for twelve physical characteristics in a boy between the ages of 10.9 and 18.0 years were computed by means of both the product-moment and Spearman's rank difference formulas. The variables correlated were measures of physical growth, while the sample (corresponding to the subjects in the more traditional coefficient of correlation) was one of 14 ages in the adolescent years.

The first factor was extracted from each correlation matrix with Thurstone's complete centroid method. Four sets of factor loadings were obtained by using two different estimates for the diagonal entries of each correlation matrix. Both the largest coefficient in a column and unity were used as the estimates of the communality.

The first factor patterns that were obtained from the different estimates of communality were very similar to each other. In this particular adolescent boy, it appeared that only six of the twelve physical characteristics had significant loadings (at least .55) on factor I, which was interpreted as general body size.

It is believed that the *P*-technique offers a valuable tool for investigations into the nature of intra-individual growth. However, as Cattell (4, p. 102)

CHILD DEVELOPMENT

has pointed out, the results found by a single study involving *P*-technique can be understood only in the light of a whole series of *P*-technique investigations, and possibly also in terms of the results of *R*-technique researches. Several such studies are currently in progress at the Institute of Child Welfare of the University of California, Berkeley.

REFERENCES

1. BURT, C. L. Correlations between persons. *Brit. J. Psychol.*, 1937, 28, 59-96.
2. BURT, C. L. Tests of significance in factor analysis. *Brit. J. Psychol., Stat. Sect.*, 1952, 5, 109-133.
3. CATTELL, R. B. *P*-technique, a new method for analyzing the structure of personal motivation. *Trans. New York Acad. Sci.*, 1951, 14, 29-34.
4. CATTELL, R. B. *Factor analysis*. New York: Harper, 1952.
5. SHUTTLEWORTH, F. K. Sexual maturation and the physical growth of girls age six to nineteen. *Monogr. Soc. Res. Child Developm.*, 1937, No. 5, (Whole No. 12).
6. STEPHENSON, W. Correlating persons instead of tests. *Charact. & Pers.*, 1935, 4, 17-24.
7. STEPHENSON, W. Some observations on *Q*-technique. *Psychol. Bull.*, 1952, 49, 483-498.
8. STOLZ, H. R., and STOLZ, L. M. *Somatic development of adolescent boys*. New York: Macmillan, 1951.
9. TANNER, J. M. Some notes on the reporting of growth data. *Human Biology*, 1951, 23, 93-159.
10. THURSTONE, L. L. *Multiple-factor analysis*. Chicago: University of Chicago Press, 1947.

ATTITUDES OF GRANDMOTHERS AND MOTHERS TOWARD CHILD REARING PRACTICES

RUTH STAPLES and JUNE WARDEN SMITH

University of Nebraska

A review of the literature on adult-child relationships reveals that little consideration has been given to the grandmother as a member of the immediate family group. References to grandparents are for the most part general in nature and based on clinical evidence. Gesell and Ilg (3) call attention to the numerous hazards of grandparent interference with parental control. Vollmer (8) observes that grandmothers possess unbending and didactic opinions concerning child care and an unwillingness to recognize the process of maturation. According to Thompson (7) grandparents and parents frequently have sufficiently differing views on what constitutes desirable child behavior to create conflicts for the children.

The practices advocated as best for child rearing have changed considerably during the past several decades. Extensive surveys of such publications have been made by Langdon and Stout (5) and by Stendler (6) showing that there has been a steady trend from a standard of strict authoritarian control toward one characterized by permissiveness, with accepted basic principles of respect for the individual, his maturity and his needs.

The present study was undertaken to test the hypothesis that the attitudes of grandmothers and mothers of the present generation of children differ in respect to child rearing practices, and that grandmothers are more strict and authoritative than mothers. A further purpose was to determine whether the degree of strictness—permissiveness in both grandmothers and mothers is influenced by: (a) the grandmother's place of residence (i.e., in her own home or in the home with her children and grandchildren), (b) the amount of education, (c) the age of assuming motherhood, and (d) the number of children in the family.

PROCEDURE

Of the several scales that have been constructed for quantitative measurement of adult attitudes toward child behavior, a recent one by Wiley (9) was selected for use. This scale has been shown to differentiate reliably

CHILD DEVELOPMENT

between attitudes of persons who have had classroom instruction in child development or counseling in children's problems and those who have not been exposed to such information. Mean scores for a group of "experts" or "specialists" in child behavior are available. Moreover it is divided into eight subscales representing a wide range of areas in child rearing practices as follows:

1. *General home standards*—neatness and orderliness expected of children, freedom allowed in choice of activities, the type, frequency and purpose of punishment.
2. *Verbal standards*—opportunity the child has to speak freely, correction of speech errors.
3. *Expression of hostility*—extent to which this is allowed both verbally and otherwise, toward adults, other children and objects.
4. *Weaning, feeding and thumbsucking*—techniques for weaning, desirability of breast feeding, establishing food habits, treatment of thumbsucking.
5. *Toilet training*—when to begin, standards for accomplishment, techniques for training, attitudes toward eliminative functions.
6. *Sexual behavior*—imparting sex information, attitudes toward sex.
7. *Boy-girl differences*—differences in standards and methods for rearing boys and girls, including cleanliness, affection and aggression.
8. *Crying*—causes; parental response to children's crying.

In the revised form used in the present study, the scale consists of 98 statements each followed by a choice of the responses "strongly agree," "agree," "undecided," "disagree," and "strongly disagree." Scoring weights of one to five are assigned to these responses, the lower figure indicating the more permissive and the higher the more strict, authoritative and punitive attitudes. Possible scores on the total scale range from 98 to 490.

The subjects were 87 grandmother-mother pairs, all from middle-class families and residents of the same midwestern city of 100,000 population. Included were both paternal and maternal grandmothers, each paired with a daughter and/or daughter-in-law who was the mother of at least one child 12 years of age or under. Of the group, 42 pairs lived together in the same home while each member of the remaining 45 pairs lived in a separate household.

Each subject was interviewed in the home and was asked, after preliminary instructions, to complete the attitude scale in the presence of the investigator. Care was exercised to prevent any discussion or comments concerning the scale until both members of a pair had completed the interview.

RESULTS

Comparison of Grandmother-Mother Groups

The total scores on the attitude scale for the grandmothers ranged from 200 to 383 with a mean of 309.65 compared with the mothers' range of

RUTH STAPLES and JUNE WARDEN SMITH

156 to 344 and mean of 264.05. The *t* test for matched groups was used to determine whether these were real population differences, grandmothers being paired with their specific daughters and/or daughters-in-law. With 86 degrees of freedom, the obtained *t* value of 10.79 is very significant at the one per cent level of confidence, indicating that the grandmothers as a group have the more strict, authoritative and punitive attitudes toward child rearing while the mothers are much more permissive in their ideas of adult control of children. This confirms the initial hypothesis. Neither group is as permissive as the group of specialists reported by Wiley (mean score 163.7).

TABLE I
COMPARISON OF GRANDMOTHERS AND OF MOTHERS ON BASIS OF
GRANDMOTHERS' RESIDENCE

<i>Groups</i>	<i>N</i> [†]	<i>Mean</i>	<i>t</i>
<i>Grandmothers</i>			
Living with grandchildren	42	318.76	2.540*
Living in own home	44	300.82	
<i>Mothers</i>			
Three generation home	41	273.88	2.647**
Two generation home	38	253.63	

[†] The variances in *N* for the groups is due to the fact that in the case of nine mothers, scores were obtained for both maternal and paternal grandmothers, and for one grandmother scores for both daughter and daughter-in-law.

* Significant at five per cent level.

** Significant at one per cent level.

Influence of Grandmothers' Place of Residence

The scores were next analyzed on the basis of the grandmothers' place of residence and are summarized in Table 1. Grandmothers living in the home with their grandchildren have a mean score of 318.76 as compared with that of 300.82 for grandmothers maintaining their own homes. Utilizing the *t* test of significance for unmatched groups, this difference proved to be significant at the five per cent level of confidence. This gives evidence of the more permissive attitude for the grandmothers who live apart from their children and grandchildren.

The mean scores of the mothers were then compared on the basis of the presence or absence of the grandmother in the family home, and a differ-

CHILD DEVELOPMENT

ence similar to that of the grandmothers in strictness-permissiveness is noted. When the three generations live together the mothers have the higher or more strict mean score of 273.88 as compared with the more permissive mean of 253.63 for mothers in two generation households. The obtained t value is significant at the one per cent level of confidence.

Areas Within the Structure of the Scale

In order to determine whether the differences in attitudes were general or limited to specific aspects of child rearing, an analysis of the subscales was made. The grandmothers were compared with the mothers according to their mean scores for each of the eight areas of child care. Table 2 presents this comparison for the grandmother-mother pairs who shared the same home, and Table 3 for the pairs where the grandmother maintained a separate residence. Under both types of living arrangements, the grandmothers' scores are higher than the mothers' on each of the subscales, and all t values are significant at one per cent level. These findings give further support to the initial hypothesis and we can conclude that grandmothers consistently hold more strict and authoritative attitudes than do mothers in all of the aspects of the rearing of children measured by the scale.

From a comparison of Tables 2 and 3, it will be noted that the scores of the grandmothers who maintain their own homes are consistently lower or more permissive than those of the grandmothers who live with the grandchildren. This difference, when subjected to the t test, proved to be significant in only four areas: *verbal standards*; *expression of hostility*; *weaning, feeding and thumbsucking*; and *differences in rearing boys and*

TABLE 2
MEAN SCORES IN THE DIFFERENT AREAS OF CHILD REARING WHEN
THE GRANDMOTHER LIVES WITH THE FAMILY
($N = 42$ grandmother-mother pairs)

<i>Subscales</i>	Grandmother <i>Mean</i>	Mother <i>Mean</i>	<i>t</i>
General home standards	37.52	33.46	4.847**
Verbal standards	48.05	43.56	3.879**
Expression of hostility	47.93	41.10	5.281**
Feeding, thumbsucking	49.83	41.41	5.805**
Toilet training	44.17	37.37	6.800**
Sexual behavior	41.98	34.76	5.845**
Boy-girl differences	40.26	35.12	4.192**
Crying	9.22	7.10	4.125**

** Significant at one per cent level.

RUTH STAPLES and JUNE WARDEN SMITH

TABLE 3

MEAN SCORES IN THE DIFFERENT AREAS OF CHILD REARING WHEN
THE GRANDMOTHER MAINTAINS A SEPARATE RESIDENCE

(*N* = 45 grandmother-mother pairs)

<i>Subscales</i>	Grandmother	Mother	<i>t</i>
	<i>Mean</i>	<i>Mean</i>	
General home standards	35.66	31.58	7.242**
Verbal standards	45.36	39.64	4.297**
Expression of hostility	43.86	38.18	4.280**
Feeding, thumbsucking	46.00	38.08	6.225**
Toilet training	43.07	34.63	7.388**
Sexual behavior	41.50	32.50	6.705**
Boy-girl differences	37.14	32.26	4.516**
Crying	8.23	6.55	4.190**

** Significant at one per cent level.

girls. When the mothers' subscale scores are compared on the basis of the grandmothers' residence, all are lower or more permissive for the mothers in the two generation family than for those who have a grandmother living with them. These differences proved to be significant in the same four areas as did the scores of the grandmothers.

Relationship Between Attitudes of Mother and Grandmother Groups

In view of the group differences which have been found, the question of a possible relationship between individual scores arises, i.e., Is there any relationship between the attitudes toward child rearing of the particular grandmother and her daughter or daughter-in-law? To determine to what extent, if any, such a relationship exists a Pearson *r* was computed for the 87 pairs of scores and proved to be +.34, significant at the one per cent level of confidence. For further analysis of this positive correlation the group was divided into maternal and paternal grandmother-mother pairs. Considering the maternal grandmothers and their daughters, the obtained *r* of +.53 for the 28 pairs who lived apart is significant at the one per cent level, while for the 37 pairs who shared a home the *r* of +.15 proved insignificant. The paternal grandmothers and their daughters-in-law consisted of only 22 pairs who were treated as a group regardless of residence. The obtained *r* of -.01 was not significant.

Influence of Background Factors

Several factors were considered as possibly contributing to the attitudes of the subjects in regard to ways of dealing with children. Treating grand-

CHILD DEVELOPMENT

mothers and mothers separately, coefficients of correlation were computed between the total score on the scale and the number of years of formal education. For the grandmothers, whose years of schooling ranged from 4 to 17 years, an r of $-.32$ was obtained. The mothers' education varied from 8 to 18 years and the r proved to be $-.36$. Both coefficients of correlation were significant at the one per cent level. For this group of middle-class urban women, their permissiveness toward child care becomes more pronounced as the educational level increases.

With respect to age at birth of first child, the grandmothers varied from 17 to 44 years and the mothers from 18 to 39 years. When r 's were calculated between this age and the score on the scale they were low and insignificant for both groups of subjects. The number of sons and daughters reared by the grandmothers ranged from one to nine, with an average of 4.4 per family. The groups of mothers had an average of 2.0 children, with a range of one to seven. No relationship appeared between the degree of permissiveness-strictness and the number of children for either the mothers or grandmothers.

DISCUSSION

Several explanations may be offered for the lack of correlation between the attitudes of mother-daughter pairs when they live together, and for the greater strictness of both grandmothers and mothers in the three generation homes. It is possible that tension-producing situations are created by this mutual living arrangement which affect the relationships involving the children. Blood (1) found that the consequences of a permissive policy with young children are in conflict with the ideals of a well ordered middle-class home. Fried and Stern (2) report that the larger proportion of older people dislike the idea of living in the home with their offspring and do not feel that they have a function to fulfill within the framework of a three generation home. Havighurst (4) states that, in middle-class families, unresolved parent-child conflicts are often reactivated when the two adult generations try to live together. It is possible that a selective factor affected the results of the present study in that people with the more traditionally oriented concepts of family life may be more apt to participate in three generation home living.

SUMMARY

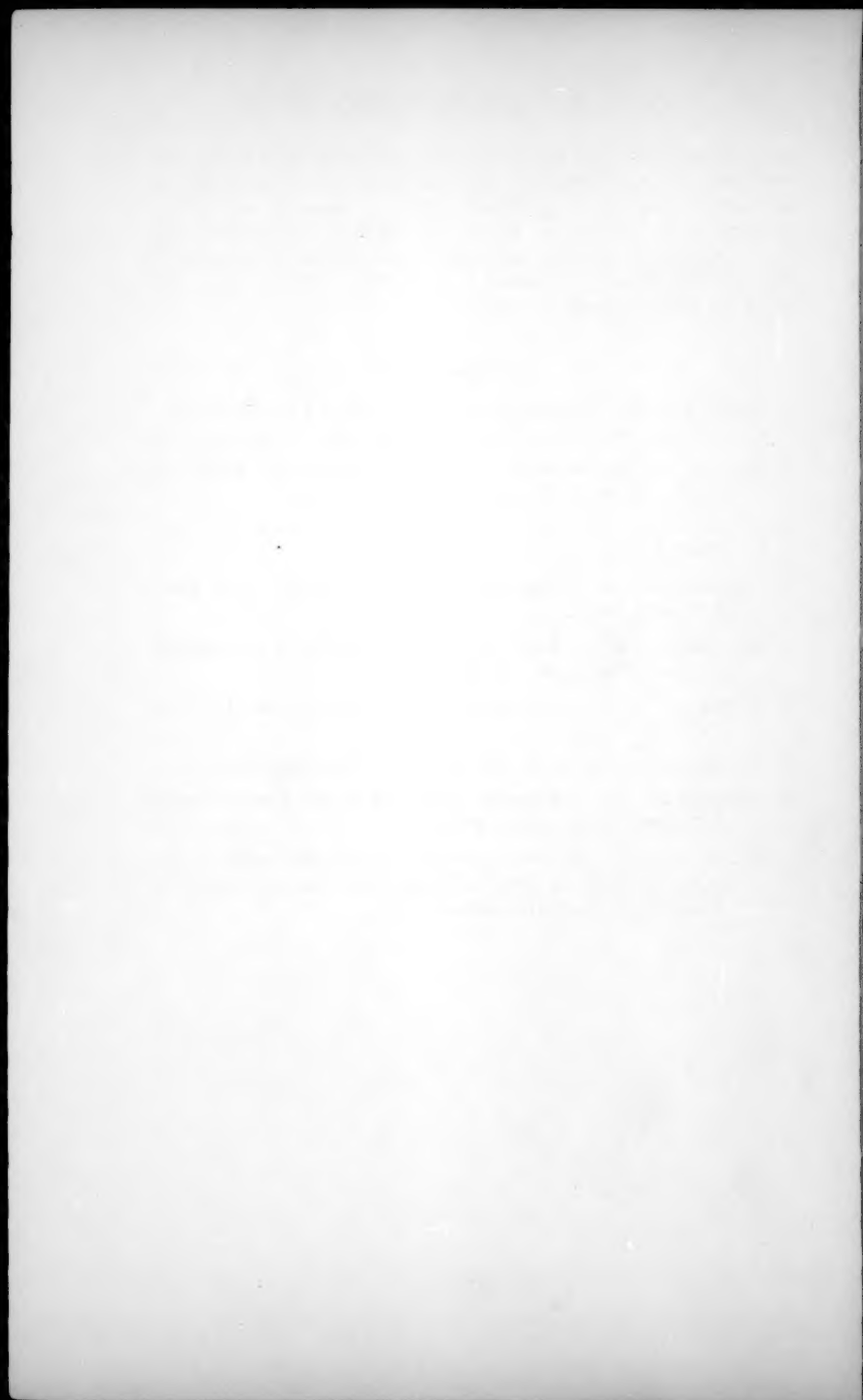
By means of an attitude scale and personal interview, 87 grandmother-mother pairs who lived in the same urban community were studied with respect to their ideas concerning child rearing. The grandmothers proved to be more strict than the mothers, this difference being evident in all areas of child care. When the grandmothers lived in their own homes,

RUTH STAPLES and JUNE WARDEN SMITH

both the grandmother and the mother were more permissive than the pairs who lived in the same household. The attitudes of maternal grandmothers and their daughters were significantly correlated when the two resided apart, but no relationship was demonstrated for those who lived together nor for paternal grandmothers and their daughters-in-law. The degree of permissiveness of both generations bears a positive relationship to the number of years of formal education.

REFERENCES

1. BLOOD, R. O., JR. Consequences of permissiveness for parents of young children. *Marriage and Family Living*, 1953, 15, 209-212.
2. FRIED, E. G., and STERN, K. The situation of the aged within the family. *Amer. J. Orthopsychiat.*, 1948, 18, 31-54.
3. GESELL, A., and ILG, FRANCES L. *The child from five to ten*. New York: Harper, 1946.
4. HAVIGHURST, R. J. *Human development and education*. New York: Longmans Green, 1953.
5. LANGDON, GRACE, and STOUT, I. W. *The discipline of well adjusted children*. New York: John Day, 1952.
6. STENDLER, CELIA B. Sixty years of child training practices. *J. Pediat.*, 1950, 36, 122-134.
7. THOMPSON, G. G. *Child psychology*. Boston: Houghton-Mifflin, 1952.
8. VOLLMER, H. The grandmother: a problem in child rearing. *Amer. J. Orthopsychiat.*, 1937, 7, 378-382.
9. WILEY, J. H. A scale to measure parental attitudes toward certain aspects of children's behavior. Unpublished doctor's dissertation, University of Southern California, 1950.



CONCEPT OF MOTHER—A STUDY OF FOUR- AND FIVE-YEAR-OLD CHILDREN

SINA M. MOTT

University School, Southern Illinois University

It is the purpose of this article to present a study of the development of the concept of *mother*. Thirty-six children served as subjects. Eighteen were, before December 31, 1952, prekindergarten children four years of age, while eighteen were kindergarten children of five years. Fathers of the children were business men, merchants, lawyers, doctors and teachers, whose income ranged from \$3,000 to around \$9,000. Of the mothers, only four of the thirty-six held positions outside of the home.

METHOD AND PROCEDURE

The study ran along two channels, oral expression and drawings.

1. In the *oral* study the child was interviewed by himself. The first phase opened with the formula: "I want to know your mothers better, so all the boys and girls are telling me about them. You tell me about your mother." If the child, after this statement and an encouraging smile, did not open the conversation he was urged by: "Tell me what she looks like." If this brought merely "I don't know," then, as a last resort, the teacher opened with "Tell me what she does." Everyone who had not described his mother in response to one or the other of the first two techniques responded to the last. Limiting herself strictly to an encouraging smile and the question "Anything else?," the teacher recorded what the child said, as he said it. After he had finished telling all he thought, the teacher then asked for the mother's name, age, size, color of eyes and hair. Responses to these questions likewise were recorded as they were given by the child.

The second phase of the study of oral expression consisted of asking the child on successive days five questions:

1. Suppose that your mother and father could not both take you to the circus. Which would you want to take you?
2. Suppose you wake up in the night with a pain. Whom do you call to take care of you?
3. Suppose you need a new pair of shoes. Who will take you to get them?
4. Suppose you are going on a picnic with your family. Tell me who will go?
5. Name all the people who live in your house.

Again the teacher recorded the responses of the child as he gave them.

CHILD DEVELOPMENT, Vol. 25, No. 2 (June, 1954)

CHILD DEVELOPMENT

2. The *drawing* study: A pilot study of the drawing technique for eliciting the concept of *mother* was conducted to determine, for example, whether the child should use several colors or one color, how this one should be selected, the desirable number of drawings of the mother and in what situation, and the precise instructions to be given to the child. On the basis of this pilot study it was decided that the procedure, illustrated by the instructions that follow, was indicated:

1. (Tuesday) Today you are going to draw a picture of your mother. She may be doing anything that you wish. You may select any color you wish but only one at a time. Draw the best picture you can.
2. (Wednesday) Today you are going to draw a picture of your mother and yourself. You may be doing anything you wish. You may select any color you wish but only one at a time. Draw the best picture you can.
3. (Thursday) Today you are going to draw a picture of your mother and father. They may be doing anything you wish. You may select any color you wish but only one at a time. Draw the best picture you can.
4. (Friday) Today you are going to draw a picture of your family. You may be doing anything you wish. You may select any color you wish but only one at a time. Draw the best picture you can.
5. (Tuesday) Today you are going to draw a picture of your mother, your father and yourself. You may be doing anything you wish. You may select any color you wish but only one at a time. Draw the best picture you can.

The drawings were analyzed by two different individuals for the following points:

1. *Colors* used in drawing the mother.
2. The *size* of the drawing of the mother (as compared with that of the father and child).
3. The *position* of the drawing of the mother (in relation to that of the father and child).
4. The activities in which the mother is engaged.
5. The score (according to the Goodenough Drawing Scale) for the mother, father and child.
6. The color used for the hair of the mother, father and child.
7. The style of hair depicted for the mother, father and child.
8. The style of clothing depicted for mother, father and child.

FINDINGS: THE CONCEPT OF MOTHER AS FOUND IN ORAL EXPRESSION

Of the ninety responses all but seven portray her in some activity. Eighty-three of the ninety responses indicate that to these four- and five-year-olds mother is an *active person within the home*—cleaning, washing, ironing, cooking, washing dishes, sewing, and cleaning the yard. To four of the children mother works at school, the store or the office. Of the ninety activities only nine were recreational in nature. Mother is a working mother keeping the home running.

Replies to the Questions Calling for Specific Information— Name, Age, Color of Eyes and Hair, and Size

Nineteen of the twenty five-year-olds knew their mother's first name. The one who did not know her first name knew her as "Mrs. S—." But only nine of the sixteen four-year-olds knew the first name. Three knew her as "mother" or "mamma," while three knew her as "Mrs. —."

The meaning of the word "mother" becomes richer and more definite as the child matures. The person who started out as mother (the child-mother relationship) becomes Mrs. — (the family relationship) and in due time Joyce—who has an individuality apart from the inner circle of the family. At this stage in his development the child is beginning to realize that his mother has a personal name as well as the relationship name; it is a vague idea at first and a bewildering one. One child expressed it, "Some people call her 'Adenia,' some people call her 'Mrs. Smith' but her real name is just 'mother'."

When asked the ages of their mothers, only five of the children's thirty-six responses were accurate. Fifteen frankly said, "I don't know"; the number who guessed, guessed a few years beyond their own ages. They knew the age of a sibling but not that of their mother. (To the four- and five-year-old, age is not yet associated with mother.)

The five-year-old has a more accurate concept of the color of the eyes than does the four-year-old. Of the five-year-old group all but three were accurate regarding eye color of the mother. Of the four-year-olds only three were correct. (Black, white and green were mentioned.)

The four- and five-year-olds alike picture their mothers with dark hair—black and brown. One said her mother's hair was "gold"—it is dark brown. A red-headed boy gave his mother's as "red," although it is really jet black. One child who might have said "golden yellow" said "brown."

Responses to "How tall or how big is your mother?" proved almost impossible to record. Ten children raised their hands high endeavoring to show by that method. Eight let it go with "big," "big as you," or "big as daddy." Eight frankly stated that they did not know. To most of them she was someone larger than themselves. Of the group, only two compared her height with that of the father, yet in their drawings they distinctly made her taller, the same, or shorter than the father. (They portray a better comparative knowledge than they express in verbal vocabulary.)

Responses to the Five Questions

These four- and five-year-old children used three different words for mother: "mother," "mamma" and "mammy." They also used three for father: "father," "daddy" and "dad." The word "mother" is used as many times as "mamma" and "mammy" together, showing that "mother" is the preferred word. On the other hand, "father" and "daddy" are used almost equally.

CHILD DEVELOPMENT

"My" is found before the words "mother," "mamma" and "mammy" forty-three times, more than half the times these terms were used in answer to the first three questions. Likewise the same possessive pronoun is found in front of the words "father," "daddy" and "dad," two-thirds of the times these words appear in the answers to the first three questions. Thus these four- and five-year-olds have a strong tendency to think of mothers and fathers as their very own, not those of another child.

The four- and five-year-old child looks to his mother rather than to his father for recreation, clothing and aid in times of pain in the ratio of two to one. It was noted that the five-year-old *girls* chose their mothers in a ratio of two to one. On the other hand the five-year-old *boys* chose their mothers in the ratio of eight to seven, and the four-year-old boys chose their mothers in the ratio of two to one.

Regarding the last two questions it is found that both four- and five-year-olds mentioned father first as many times as they do mother.

FINDINGS: THE CONCEPT OF MOTHER AS EXPRESSED IN DRAWINGS

Different Colors Used in Drawing the Mother

In the pilot study the child first selected a color, then was told what to draw. The colors most often selected were red and blue (proportion 1:3) and green. Those least often were black and brown (proportion 1:86).

Using the proportions found in the pilot study as a basis for evaluation, final results show that:

1. The choice of red in proportion to the total (1:4) remains constant no matter with whom the mother is grouped.
2. In the pilot study the ratio for purple to the whole was 1:17; in the study it is 1:16 but, unlike red, it varies with the picture. When mother is drawn *alone* it reaches the high proportion of 1:5, but when she is drawn with the child or with the father and the child it drops to 1:35 and 1:30.
3. When the child draws the mother *alone* he does not choose yellow as often (1:21) as when he associates her with another member of the family (1:9). He chooses it most often when he places her in the midst of the family.
4. The choice of blue when drawing mother *alone* is 1:5 but when father is added the proportion drops to 1:15.
5. When the mother is drawn alone she is usually red, purple or blue, but when she is surrounded by her family she is red and yellow.

Colors Used in Making the Hair of the Mother

There were eleven opportunities for drawing hair: five for the mother, three for the father and three for the child, making a total of 396. Had each of the five-year-olds drawn hair on all eleven characters there would have been 198; there were 160. The failure to draw hair, in a number of

cases, was because the character itself was not drawn. In most cases this was the father. Four-fifths of the drawings made by the five-year-olds have hair in varying colors, while less than half (84 of 196) of the drawings of the four-year-olds have hair.

In the pilot study the proportion was 1:86 for black and brown, but in the second study black became 1:7 and brown 1:9. The proportion for choice of black by the four-year-olds in portraying hair was 1:26 and that for brown was 1:77. Five-year-olds were much more realistic in their drawings, for the proportion jumped to 1:3. Apparently the child at five distinguishes hair color as different from the color of the face or clothing. This is further emphasized by the fact that the four-year-olds use red for hair color in the proportion of 1:2, while the five-year-olds drop it to 1:14.

In summary it may be stated:

1. When the five-year-old selects colors for color's sake he chooses black and brown to the ratio of 1:86, but when using colors to portray the hair of his mother, family and himself he selects brown 1:9 and black 1:7.
2. The five-year-old is far more realistic in portraying the hair than the four-year-old. More older children add hair, and more attempt to use the correct color.

Scores Received on the Drawings of Mother Compared with the Scores Received on the Drawings of Father and Child

The drawings were scored by two individuals according to the Good-enough Drawing Scale. The majority of mother drawings received higher scores than the drawings of the father and child. Mother drawings outweighed father 2:1, the child 5:1. The child took greater care with the drawing of the mother; as an example, the arms, hands or feet often were lacking in the drawing of the father or child.

Size (Length) of the Drawings of the Mother Compared with Those of the Father and the Child

From the data it was evident that:

1. The child thinks of his mother as taller than himself. Out of ninety-three drawings of the mother and child, seventy-eight made the drawing of the mother longer than the drawing of himself. In only ten drawings was she made the same size and in only five was she made shorter.
 2. Of the ninety-two drawings of the mother and father it was noted that thirty represented the mother taller, twenty-three the same height, while thirty-nine, more than a third, shorter than father.
- In summary it may be said that the child sees his mother as a person taller than himself and a little shorter than his father.

Style of Hair Depicted for the Mother, Father and Child

Upon checking the style of arrangement it was discovered that it might be classified under four categories: (a) the hair (straight or curly) drawn

CHILD DEVELOPMENT

on three sides of the face; (*b*) the hair arranged on top of the head; (*c*) the hair standing out like pins in a pincushion; and (*d*) the hair on only two sides of the face, representing a bald head. The significant facts here are:

1. One-third of the drawings having hair style were drawn by boys and the remaining two-thirds by girls. This difference in number is not entirely due to the fact that many of the girls are older than the boys, for the younger girls also represent hair.

2. According to the arrangement of hair portrayed by these children the boy sees his mother, and girl sees her mother (and herself), as having hair on three sides of the face. Five-sixths of the drawings of the mother, and four-fifths of the drawings of the girls were thus portrayed.

3. Both boys and girls see father as having short hair. Three-fifths of the drawings had style (*b*), hair on top of the head. It is of interest to note that those who portrayed the child as having style (*b*) were boys.

4. It appears to be an individual matter that the child thinks of mother as having straight or curly hair; not so the father, for nine times as many drawings portray him having straight hair.

In conclusion it may be said that the child thinks of his mother as having either curly or straight hair on three sides of her face, in contrast to the father who has straight hair on top of his head.

Style of Clothing Depicted for Mother, Father and Child

In order to make a comparative study of the type of clothing all five drawings of mother, three of the child and three of the father are used. It became evident that most of the clothing representations might be grouped into four categories: A waist and skirt on the mother or child; shirt and pants on male figures; a round body with a triangular skirt; and a triangular dress which had its most acute angle at the neck. Aside from these representations thirty-eight drawings showed only the head, with its features, and the body with arms and legs. Forty drawings had only the arms and legs dangling from it.

Position of the Mother in Relation to the Father and the Child

There were thirty-four drawings of the family and seventy-six of mother-father-child, making a total of one hundred ten. Analyzing these drawings of the family it was found that: (1) four of the thirty-four omitted the father, (2) four of sixteen omitted the sibling, (3) six of fifteen omitted one of several siblings, and (4) no one omitted the mother; she was always included.

Analyzing the data it was found that there are three positions: (1) mother occupying the center, (2) father occupying the center and (3) the child occupying the center. There are two times in which a sibling entered the picture between the child and the mother.

Almost half of the pictures portrayed the mother in the center of the family. Less than a third portrayed the father as the center, and less than a third portrayed the child as the center of the family. At this age the child characteristically pictures himself near or next to the mother. This was true for 77 of the 110 pictures. It may therefore be stated that the four- and five-year-old child most often places his mother in the center of the family and himself next to her.

Activities of the Mother as Portrayed in the Drawings

"Today you are going to draw a picture of your mother. She may be doing anything you wish." This was the statement made to the children on the first day, and the others differed from it only in the personalities to be drawn. Upon finishing the drawing the child brought it to the teacher, at which time the teacher said, "Tell me what is she doing." The child's response was then written on the sheet containing the drawing. This same general procedure was followed with each drawing.

Of 157 activities, fifty-five are located in the home. Listed in their order of frequency they are: washing dishes (11), cooking (10), washing (9), hanging up clothes (5), working (6), cleaning (4), building (2), making beds (2), painting (2), gardening (2), giving me a bath (1), and putting me to bed (1). Mother, to these children, is someone actively engaged in the home.

But the drawings portray a mother with a far wider range of activities. Mother is on the go: walking to town, to the store, to school, etc. Not only does she go, but she has time for recreation. Mothers enjoy eighteen different kinds of recreation: looking for birds, picking flowers, camping out, going to the fair, parties, movies, dancing, visiting, giving presents, watching dad, etc. Again and again come intimate home pictures: putting me to bed, bathing me, giving me a present, loving me, looking after daddy. Mother means more than just someone who runs the home.

SUMMARY AND CONCLUSIONS

A study of the development of the concept of "mother" was made of the oral responses and 234 drawings of "mother" made by eighteen four-year-olds and eighteen five-year-olds at University School.

1. From their oral expressions and from their drawings, mother is that very active person who keeps the home running—cooking, cleaning and washing dishes. The drawings portray a wider range of activities of a recreational nature and of intimate home life. Mother is one who cares for them and comes to their aid in times of stress.

2. The physical appearance of mother is not clear or definite; she has eyes (when asked about them) but not of a particular color. She has hair (when asked about it); according to the drawings it is either straight or

CHILD DEVELOPMENT

curly, growing on three sides of the face. Most four-year-olds use the same color for hair as they do for the rest of the figure; the five-year-olds go to the trouble of selecting another color, mostly black or brown. She has clothes, but only two of the thirty-four children mention them in the oral expression. Very few of the four-year-olds distinguish mother from father. The five-year-olds discriminate between sexes by drawing the triangular skirt rather than pants. Mother has size, but it is relative—shorter than father, taller than themselves. She has age, but when asked about it half say they do not know how old she is, and half of the remainder give it as ten years or younger. In other words, time is not associated with mother at this age.

3. The word "mother" is beginning to take on a universal connotation. It has two synonyms: "mamma" and "mammy," but they are not as popular as the word "mother." The five-year-olds start using "my" to distinguish their mother from those of the other children. Many of the five-year-olds have come to know that "my" mother is Mrs. —, and that she has a first name which daddy and the people outside of the family call her.

4. When four- and five-year-olds select colors for drawing mother alone they select red, blue and purple; but when she is one of the family she is either red or yellow.

5. Mother is placed most often in the center of the family with the four- and five-year-old child next to her.

COLOR USAGE IN NURSERY SCHOOL PAINTING

AMBROSE L. CORCORAN

State University Teachers College, Brockport, N.Y.

In recent years investigators have given attention to the possibility that the use of color may provide clues to the personal and social adjustment of young children (1, 3, 5). Studies of this type have been devoted mainly to two kinds of activities, finger painting and easel painting. The methods used in these investigations have a common element in that the subject is confronted at the outset of the experiment with several colors from which he chooses one with which to begin his activity. Either this first choice or the amount of various colors in the completed work constitutes the data to be gathered. The validity of any conclusions and the value of any inferences that are drawn from data relating to the initial choice of color made by young children is dependent upon whether these first choices are free from influences of one kind or another.

Among the influences which might possibly affect the first choice of color used by nursery school children in their paintings is the order in which the colors are arranged for the child to use. Especially among pre-school children the possibility is suggested that the initial color chosen by them to begin a painting may not be as much a function of choice as it is a result of the arrangement of colors presented to them. Smith (6) found that the color which was placed on the right was selected first more than 50 per cent of the time. Staples and Conley (7), in addition to Smith, noted that nursery school children frequently used color in the exact order of presentation. If this were a significant aspect of the painting behavior of the child it could possibly mean that the element of choice is largely absent in painting at some levels of development.

The present study was designed to investigate the extent to which first choices made by nursery school children in painting were influenced by the arrangement of the colors with which they were presented. A second purpose of this investigation was to examine the frequency with which three-year-old children made use of colors in sequential order.

HYPOTHESES

The central postulates to be tested in this investigation were:

1. *The order of use of color by nursery school children in their easel paintings is influenced by the arrangement of colors in the easel trough.* To support this hypothesis it would be expected that colors on the extreme

CHILD DEVELOPMENT

left and right of the trough would be used first more than any other color. It would also be expected that children who use their right hand when painting would begin painting with the extreme right hand color more than any other color.

2. *Three-year-old children use colors in the sequential order of their arrangement to a significant extent.* Chi Square analysis was to be applied to determine whether the frequency of this occurrence attained the five per cent level of significance.

EXPERIMENTAL DESIGN

Twenty children, ten boys and ten girls, attending the Nursery School of the Home Economics School of the Pennsylvania State University were the subjects in this study.¹ These children ranged in age from three years to three years and ten months. The experiment was conducted between the hours of 9:00 A.M. and 11:00 A.M. over a period of four weeks. Each child painted twice, each time with a different arrangement of colors.

One double easel was set up in the painting area of the nursery school room. Four jars of tempera paint, mixed fresh daily, were placed in the four compartments on each side of the easel. Care was taken to achieve a like consistency among the four colors. The jars of paint were located in the compartments so as to be equal distances apart.

A new $\frac{3}{8}$ inch bristle brush was placed in each jar so that the handles of the brushes projected upward toward the child at an angle of 180 degrees rotation from the side of the jar which was tangent to the easel surface. Brushes and jars were wiped clean when each painting had been completed and were then relocated in the original way for each trial.

The colors were arranged in random order for phase one of the experiment. In order from left to right were: red, yellow, blue, and black. For phase two of the experiment, the positions of the colors were interchanged so that the colors which had been at the ends of the trough were substituted for those that had been in the center. The order of colors for phase two, from left to right, was: blue, black, red, and yellow.

Each subject was invited to paint but was not compelled to paint if the activity did not interest him at that particular moment. In the course of the experiment nineteen children painted twice. Each of these children made one painting under the conditions of phase one and one painting under the conditions of phase two.

A chart was prepared which contained the name of each child and two columns which were headed by the order of colors for each phase of the experiment. As the child proceeded to paint, the observer scored 1, 2, 3, 4 to indicate the order in which the colors were used.

¹ This number was reduced to 19 since one girl did not choose to paint during the course of the experiment.

AMBROSE L. CORCORAN

TABLE 1
SUMMARY OF COLORS USED FIRST IN EASEL PAINTINGS OF
19 NURSERY SCHOOL CHILDREN

	Phase One				Phase Two			
	Red	Yellow	Blue	Black	Blue	Black	Red	Yellow
Frequency . . .	5	2	5	7	3	3	5	8
Per Cent . . .	26	10	26	37	16	16	26	44
z				0.9				1.52

RESULTS

The number of first choices for each color during both phases of the experiment is shown in Table 1. In phase one, black (the right hand color) ranked first with a percentage of first choices amounting to 37 per cent. In phase two, when yellow was the right hand color, it was used first 44 per cent of the time. A z test (z) of significance ($z = [X - M] / \sigma$) showed that the null hypothesis could not be rejected at the 5 per cent level of confidence. The value 1.52 indicated that the differences in the frequency of use of yellow over the other colors in phase two might be expected to have occurred by chance six or seven times in 100. The chance expectations from the value for black in phase one would be approximately 18 or 19 times in 100 trials.

When the first choices of both phases were combined and totaled, the distinctions among colors that were used first practically disappeared. Red, yellow, and black were used first equally often and blue was almost as often used first as the others. This is shown in Table 2.

The positions that were selected first irrespective of color are shown in Tables 3, 4, and 5. The extreme right hand position, d , was seen to have

TABLE 2
RANK ORDER OF COLORS USED FIRST BY NINETEEN
CHILDREN IN TWO TRIALS

Rank	Color	Frequency	Per Cent
1	Red	10	26
1	Yellow	10	26
1	Black	10	26
4	Blue	8	22

CHILD DEVELOPMENT

been chosen 39 per cent of the time by all and 38 per cent of the time by right-handed children. When a test of significance was applied to the difference obtained between the choice of combined end positions and the choice of the combined intermediate positions it was found that this was not significant at the five per cent level of confidence. (A value of 1.98 is needed at this level). A tendency to choose the end positions was observed from the fact that they were chosen first 60 per cent of the time.

Twelve of the 19 subjects painted in the exact sequence of the presentation of the colors at least once on the two trials. Table 6 shows that in

TABLE 3
FREQUENCY OF POSITIONAL FIRST CHOICES IN 38 EASEL
PAINTINGS OF NURSERY SCHOOL CHILDREN

	P O S I T I O N			
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
Frequency	8	5	10	15
Per Cent				39
<i>z</i>				1.88

TABLE 4
POSITIONAL FIRST CHOICES IN 34 EASEL PAINTINGS OF
RIGHT-HANDED NURSERY SCHOOL CHILDREN

	P O S I T I O N			
	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
Frequency	7	5	9	13
Per Cent				38

TABLE 5
FREQUENCY OF FIRST CHOICES OF END POSITIONS VS.
INTERMEDIARY POSITIONS IN 38 EASEL PAINTINGS
BY NURSERY SCHOOL CHILDREN

	P O S I T I O N	
	<i>Ends</i>	<i>Intermediaries</i>
Frequency	23	15
Per Cent	60	
<i>z</i>	1.14	

AMBROSE L. CORCORAN

TABLE 6

FREQUENCY OF THE USE OF COLOR IN THE EXACT SEQUENTIAL
ORDER OF PRESENTATION IN TWO EASEL PAINTINGS
OF 19 NURSERY SCHOOL CHILDREN

Case	Phase One	Phase Two	Both Phases
1	x	x	xx
2	x	x	xx
3	x	x	xx
4			
5			
6	x		x
7	x	x	xx
8			
9			
10	x		x
11			
12	x		x
13			
14			
15	x		x
16		x	x
17		x	x
18		x	x
19		x	x
Total	8	8	16
Chi Square = 163 $P = < .001$			

each phase of the experiment, colors were used in the sequential order of their arrangement from left to right or from right to left eight times. The sequence *d, c, b, a*, or *a, b, c, d*, would be expected theoretically to occur by chance once in each 12 trials. In 38 trials it would be expected that the occurrence of the sequence would be observed in either direction 3 and 1/6 times as a chance probability. Table 6 shows that the frequency obtained occurred 16 times. Chi Square was used to test the null hypothesis. The analysis demonstrated that an obtained frequency of this magnitude would be expected to occur by chance less than once in one thousand times.

LIMITATIONS OF THE EXPERIMENT

The experiment included only two arrangements of the four colors. Ideally, it would have included all possible arrangements of the colors that

CHILD DEVELOPMENT

were used. This would have necessitated a 24 phase experiment. Since it was desired primarily to discover whether there was some such influence in any arrangement, it was not considered necessary to include all 24 phases.

The four colors selected for the experiment were chosen because they are commonly encountered as basic colors. Children of this age were likely to be familiar with all four of them. It is possible that four other colors or that a different combination of hues would yield the same or different results.

The number of colors used was limited to four in order to keep the experimental design simple. An additional factor in limiting the number to four is the feeling among art education specialists that children of this age are assisted in their creative efforts by limiting the number of colors at their disposal (4).

The sample used in this study was a selected one and may not be representative of the larger population of three-year-olds. Although the data seem to be essentially in agreement with the findings of other investigators, the results with this group may not necessarily hold for other groups of the same or different ages. Rae M. Smith's findings were substantially as found here even though different colors were used and colors were rotated in position rather than interchanged.

CONCLUSIONS AND DISCUSSION

Although the data did not withstand statistical criteria of significance in support of the hypothesis that the order of use of color by nursery school children was influenced by the arrangement of the colors along the easel, the tendency of the evidence in the direction of the hypothesis was noteworthy. It would be hazardous to ignore the possibility of influence caused by the presentation and arrangement of color in experiments seeking to relate first choices to the concept of preference for color.

The most striking finding of this investigation was the evidence that three-year-old children used colors at an easel in sequential order of presentation to a significant extent. The majority of the children taking part in this study demonstrated such a painting behavior in two trials at the easel. The analysis of the number of times this event was observed throughout the experiment showed that the amount of this behavior was not likely due to chance. Staples and Conley commented on the occurrence of sequential use of color in their study of children's finger paintings but they did not furnish tests of significance (7).

Perhaps in this facet of behavior there is some evidence in support of theorizing regarding the preschool child's approach to painting. It might be said that the approach to painting among nursery school children of age three to four is one of directness of application of color rather than one of selective discrimination between and among colors. The mode of painting

AMBROSE L. CORCORAN

is to apply the color without conscious deliberation and to react to the color as it is spread out on the paper. This would explain, to some extent, why overlaying of color and painting out previously colored areas is so commonly observed among preschool children. What would appear, then, to be a seemingly mechanical approach is possibly better considered to be a rather efficient method by means of which children test the color to determine its affective value for them.

The significance of such findings for education would be simply to reinforce the now widely held viewpoint which sees painting at this level as mainly exploratory and recognizes that the activity is in itself rewarding to the child. For, among other things, he discovers his reactions to color through the process of using it.

REFERENCES

1. ALSCHULER, R. H. and HATTWICK, L. B. W. *Painting and personality*. Volumes I and II. Chicago: University of Chicago Press, 1947.
2. EDWARDS, A. L. *Experimental design in psychological research*. New York: Rinehart and Co., 1950.
3. KERR, A. H. Color preferences in creative painting of socially accepted vs. socially unaccepted six- and seven-year-old boys. Unpublished masters thesis, University of Tennessee, 1950.
4. LOWENFELD, V. *Creative and mental growth*. New York: Macmillan Co., rev. ed., 1952.
5. NAPOLI, P. J. Finger painting. In H. H. Anderson and G. L. Anderson (Ed.) *An introduction to projective techniques*. New York: Prentice Hall, 1951. Pp. 386-415.
6. SMITH, R. M. A study of the relation of the position of color to the choice of color of preschool children in easel painting. Unpublished masters thesis, Ohio State University, 1947.
7. STAPLES, R. and CONLEY, H. The use of color in the finger paintings of young children. *Child Developm.*, 1949, 20, 201-212.

WILD CHILDREN AND THE PRINCIPLE OF REINFORCEMENT

MARIAN W. SMITH

London School of Economics

Wayne Dennis has recently returned to his discussion of alleged cases of children partially reared in isolation or in association with animals (2). His conclusions confirm his earlier analysis (3) and he insists that the utmost caution be used in accepting the evidence on feral children. As he points out, it is difficult to see how such evidence can ever be anything but inconclusive.

The more important aspect of the discussions on wild children concerns the applicability of such data as do exist to the general question of the socialization of the human offspring. There is a tendency to regard these data as substantiation for the hypothesis that early conditions of nurture are important in the future life of the child. For purposes of analysis Dennis first accepts the evidence and then proceeds to review six cases from Singh and Zingg (5) on which the fullest data are available. Quite rightly, he refuses to accept his own analysis of these cases: "that the socialization which ordinarily takes place during the early years is readily lost upon close contact with animals; that animal influences are relatively permanent." As I understand it, Dennis is not in disagreement with the hypothesis concerning the importance of early nurture but wishes to be most exact in outlining its conditions. In the present paper, I should like to carry the analysis of Dennis' cases a step further and to discuss a principle which seems to overcome the dangers of an over-simplified argument concerning the importance or lack of importance of the early years of rearing. I will also indicate the nature of the field investigations in India¹ which led to my utilization of this principle, tentatively called here "the principle of reinforcement."

It should be noted that the principle of reinforcement differs in important respects from reinforcement theory as employed in psycho-sociological studies of learning. Reinforcement as used in this paper means more than the reward which reinforces the response in a simple stimulus-response situation, a point which will be referred to in greater detail below.

¹ Field work was made possible by the financial assistance of the Wenner-Gren Foundation for Anthropological Research and the Social Science Research Council.

CHILD DEVELOPMENT

TABLE I
SUMMARY OF DENNIS' DATA ON SIX FERAL CHILDREN
REPORTED BY SINGH AND ZINGG

Case No.	Estimated Age at Isolation	Estimated Age at Discovery	Period of Isolation	Recovery
II ...	3 years	9 years	6 years	Never learned to speak, very little improvement
V ...	6 years	10 years	4 years	Learned to walk, no other data
VI ...	4 years	10 years	6 years	Learned to walk, learned to obey signs but never learned to speak
VII ...	less than 4	4 years	? months	Went to school, eventually became a policeman
XI ...	2 years	5 years	3 years	Learned to walk, to eat vegetables, and to be friendly
XXVI ...	less than 3	3 years	? months	Learned to walk, eat and drink like a human being, laughed often and loudly, did not learn to use or to understand language

Before the six cases can be analyzed it is necessary to accept them as evidence, even if only temporarily. Dennis' method in this connection is therefore followed and I have summarized his data in Table I. Although I agree with him in his caution on the value of this evidence, I should add parenthetically that I am not greatly impressed by the analogy he draws in his earlier paper between the behavior of feral children and the behavior of children who are mentally defective. Unless we suppose that the cases on record were discovered within a day or two of their abandonment or loss—and although Dennis suggests this, there seems no evidence to support it—we are forced by this interpretation to attribute considerable survival value to subnormal mental conditions. This is a conclusion which I am little inclined to view favorably. In the six cases noted, it is to be remarked that five were said to be lost to human socialization at or just under three years of age. By that time, a child might conceivably manage to subsist alone without animal intervention. The trait which most suggests animal rearing to my mind is that of eating raw meat. Dennis quotes Zingg's quotation of Tredgold to the effect that some idiots will eat and drink anything (2, p. 430). He fails to point out that a preference for raw meat is not the same as an avidity for anything within reach. It is difficult to see how a child of three would obtain raw meat without assistance or how a child would hit upon killing for food unless some imitative

MARIAN W. SMITH

training were involved. This would be especially relevant in India where many children would have no experience of even cooked meat.

To be parenthetic again, I am more in accord with Dennis' early observation that feral children have generally been reported from just those areas in which the folklore contains references to children reared by animals. It is certainly true, as he points out, that events tend to be interpreted in terms of belief and one cannot escape the feeling that many of the reports of feral children have been thus influenced. However, this suggestion needs careful checking for particular cases against their own local traditions and customs. So far as I know no adequate or convincing study has been made of wild children along these lines. The interplay between reality and belief is far from simple. Not only do people interpret as they believe but they base their behavior upon their interpretations. At least one study suggests that events themselves are affected in the direction of folk belief (4, for discussion see also 6, 295-296). In view of the complexities, it seems wise to leave out such interpretations until more is known of the mechanisms involved. At any rate, all such discussion of feral children must necessarily exist *in vacuo* because of the nature of the evidence. It is more important to examine the way in which the evidence has been used.

In his analysis of the six cases, Dennis makes telling use of the fact that exponents of the traditional view, i.e., that cases of feral children provide data confirming that early childhood influences are relatively permanent in their consequences, overlook the purely human influences of the period of growth before abandonment. Since his analysis is directed particularly to this point, it takes little account of the duration of the period during which human influences are allegedly absent. In the table summarizing the data, therefore, I have included a notation to this effect. The cases show a total of twenty-two years of initial human socialization over the six cases, varying from two to six years. This was then followed by a total of something over nineteen years of isolation or non-humanized adaptation, varying from a few months to six years. In all cases except one, the effect of isolation was not subsequently obliterated. The traditional view is to regard this period of early, although not initial, experience as definitive in later behavior. Dennis feels that the early period of socialization makes such a conclusion untenable. He asks, in effect: if early influences are significant in determining behavior, what has happened in these cases to the initial influences toward socialization?

But the data may also be subject to another interpretation. The longer the period of isolation the more permanent its effects seem to be. The three cases in which isolation lasted from four to six years were those in which there was apparently least recovery. One case with an isolation of three years recovered enough "to be friendly." The two cases in which isolation may be estimated in terms of months rather than years varied, one showing marked but not complete recovery, the other recovering sufficiently to

CHILD DEVELOPMENT

assume a normal place in human society. The question, therefore, is not whether the early years of socialization have been influential, but concerns the period of isolation required to neutralize the early socialization.

Since all of this discussion is carried out under the temporary assumption that the data on feral children are to be accepted, it is legitimate to ask a further question. Would not the effect of abandonment, or alleged theft by animals, be greater than a mere discontinuity in training? Suppose that a child conditioned to normal human care be suddenly deprived completely of that care under circumstances demanding a maximum of readjustment of every learned response and at the same time instilling, at least in the beginning, terror or other strong emotional stress. Such a picture can hardly be understood in terms of socialization and its withdrawal. There are data to suggest that simple bilingualism makes for a period of psychic maladjustment. The sudden reorientation which we must assume to have occurred in the survival of the feral child, however that survival may have been implemented, might be supposed to have a psychic effect of much greater magnitude. The mechanisms by which this might be accomplished, however, remain unclear.

In carrying out anthropological field work among Punjabis from East Punjab, India, and West Punjab, Pakistan, in 1948-1949 I was presented with a problem of nurture not unlike that under discussion. The more complete of my data on child training came from followers of a religion called Sikhism which is a Hindu reform sect. The picture of Sikh infancy and early childhood obtained was one in which the child was well loved, anal training was gradual and unaccompanied by trauma, and weaning was delayed; the demands on the child were made quite clear and placed within his capacity, success was rewarded and failure punished but punishment was never associated with rejection or withdrawal of love; and wants were often interpreted and fulfilled before they were intense enough to be expressed, certainly before any crying occurred. The last element, in particular, helped to set up a strong dependency relation not only with the mother, but because of the nature of the family situation, with other members of the family as well. The data supporting these generalizations are, naturally, voluminous and need not be repeated here. It is enough to point out that the same picture of early child training was obtained, although the investigation was admittedly not as complete, for Punjabis who were followers of Islam (what is often called Mohammedanism by Western scholars).

Certainly the broad outlines of child training are similar for the two groups, and they are sufficiently unlike ordinary Western training to be readily observable. Adults of both groups revealed the characteristics of the generally "secure" personality, characteristics which might be expected to result from such early rearing, including generosity, self-assurance,

MARIAN W. SMITH

ability to succeed in unfamiliar tasks, lack of excessive guilt, and capacity for coping with the demands of a complex social, and difficult economic, environment. These traits are by no means the only ones which can be isolated in Punjabi character structure, and I have as a matter of fact outlined their cause-and-effect nature with a greater assurance as to the mechanisms involved than I actually feel to be warranted. Partly this is because they suffice for our present purposes and partly because I wish immediately to introduce other factors.

My field work in the Punjab was done after eight years of previous library research and work with Punjabis in the United States and Canada. During these years the whole national situation had radically shifted. The year before I went to India had seen the partition of the subcontinent and the resultant shifts of population between the newly constituted sovereign states. Everyone knows of the accompanying disorders during which much damage was done to both life and property. All that we need emphasize here is that our two groups, Sikhs and Muslims, were actively engaged in hostile actions against each other. This demonstrates, what is clear enough anyway but often apparently overlooked, that learning consequent upon the early years of life, even learning in the academic or ideological sense, materially affects adult behavior. More importantly, it poses the problem of possible differential treatment in childhood which sets the stage for the eventual differentiation of Sikhs and Muslims.

Mention has already been made of the fact that the first years established a pattern of strong dependency for these individuals. In both groups, however, the explicit and quite articulate aim is to raise male children who are "men," i.e., self-dependent, brave in enduring hardships, staunch in loyalties no matter what form opposition may take, and capable of self-sacrifice for ideals. Infant training is relatively the same for girls and boys. But by the time male children are four or five, both groups begin a gradual process of weaning them away from dependency. Sikh boys who cling to their mothers' skirts in the presence of strangers are urged to come forward and not be "shy." They are never, of course, forced away from their mothers nor is it a punishable offence if they refuse, but positive rewards in praise and attention accrue if they do. Children of both sexes care for smaller siblings and there is a marked tendency for children to move through the villages and their environment in groups or gangs relatively isolated from adult control. Independence from female supervision is further accentuated for boys by the fact that they are intentionally brought into the male world by the age of six or seven. In both groups, women's activities are more or less limited to the house compound and they seldom meet guests or strangers. Little boys, however, accompany their fathers and uncles on errands and visits, and form a natural part of the male family group which carries on all extrafamilial affairs. By ten or twelve, boys often join the

CHILD DEVELOPMENT

adult men in sleeping in the combination guest- and men's-quarters within the compound.

The early dependency of male children is, therefore, gradually and quite effectively shifted in the direction of self-reliance and male responsibility. The first years of nurture leave a residue of great familial warmth but because other factors are introduced the results of training are radically changed, if not, in some respects, negated. On the other hand, female dependency is reinforced through the comparable years of childhood and what change occurs leads only toward the ultimate transfer of dependency from blood kin to husband and husband's family. It is only after marriage and the birth of her own children that the woman achieves a self-reliance which can be compared with that of her spouse. Even then, the outer symbols of female dependency are valued and generally retained until well after middle age. In the light of these data, adult behavior may be said to depend not only on the nature of training but also, and in large part, on the extent to which that training is reinforced.

Distinctions may also be seen in the development of males of the two groups. Sikhism and Islam have a number of points of similarity. But there are also important differences between them, one of which will serve our purpose here. Whereas Muslims are taught to respect and to follow the Law as laid down in the Koran, Sikhism explicitly establishes a less rigid responsibility. The Khalsa, which is the heart of religious organization and responsibility, may be set up at any time and in any place by any five adult males. Where there are five Sikhs, there is the Khalsa; and the allegiance they owe to a central religious body is completely voluntary. It can be seen that the self-reliance expected of Sikh men is almost complete. The expectation rests in its turn on the firm knowledge that security within the family is absolute. Family property is held jointly in the male line. Although there has been fairly recent legislation to the effect that this applies only to adult males and other changes in the definition of family properties have also been made, the feeling is still strong that any male, of whatever age, is directly concerned. Sale of land, therefore, is discussed in the presence of male children and their consent is regarded as desirable if no longer legally necessary. A man may not, in the last analysis, ever be deprived of his rights within the family. Absences up to forty years in duration may be followed by complete reabsorption into the family economy. I have several cases of men who had to leave their villages because of ill-conduct being similarly accepted later. One, for instance, ran away with another man's wife, an action which violates every Sikh code. Yet after the couple lived together for a number of years in a distant city, the man returned to his village and his family after the death of the woman, and brought with him their grown son. In childhood this absolute family solidarity in the face of any behavior is expressed by full adult support, at least in public. A little

MARIAN W. SMITH

boy who is in a scrap with another child may be completely in the wrong—his father will reprimand him privately but defend him against the family of the other boy. This probably happens relatively seldom but I again have cases of actual battles between the men of large sections of villages over just such incidents, battles in which the naughty child was only too proud to participate. Sanctions of numerous sorts are of course used against ill-conduct but in the last analysis, *no* behavior on the part of the male Sikh can deprive him of family support whether moral or financial. The same may be said for the woman with grown sons. A place in a family in this society also means a place in the village and the social system in general so that security is further reinforced. Although many of these social and economic factors hold equally for the Punjabi follower of Islam, his religion presents him with more explicit rules of conduct and he does not have the same thorough-going social and religious reinforcement for the validity of his own behavior, however self-determined.

From the Punjabi data so briefly summarized above it can be seen that the general personality depends upon early nurture. On the other hand, some of the effects of the initial patterns of nurture are intentionally reversed in later training. This reversal is not so complete for Muslims as for Sikhs but in either case its success is apparently due to the consistency with which the elements of the social environment contribute to the same result. It may be concluded, therefore, that the early years of nurture are important in determining future behavior. But it may also be concluded that conditions of life subsequent to the first years are almost equally significant to adult behavior. Neither of these conclusions is revolutionary in any sense. They are probably both accepted by all those interested in child development who are not espousing some one theory to the exclusion of others. What is more important is the idea that behavior is affected by the extent to which conditions reinforce each other.

This principle of reinforcement apparently operates in two ways: 1) through influences which succeed each other in time during the development of the child but proceed from the same general source, and 2) through influences which may occur more or less simultaneously but which, in any case, derive from different aspects of the total socializing environment.

The significance of reinforcement is now mainly recognized in the familiar conflict situation in which, for instance, permissive training is disrupted and alternates with excessive discipline, or the effects of maternal and paternal care operate in different directions. Ideally in society, maternal and paternal care supplement each other so that the effects of the two are absorbed together. Conflict seems to arise when they function at cross-purposes. The principle of reinforcement used here is less a re-statement of these mechanisms than a view which includes within the socializing

CHILD DEVELOPMENT

environment the total area of influence to which the child is subjected and at the same time broadens the definition of nurture so that it is not limited to idiosyncratic elements.

The socialization of the child is accomplished not only through the media of particular individuals with whom he comes in contact but also through the recognition of larger configurations. As he grows older these impinge upon him from an increasing number of directions and with increasing strength. In the first years of life many cultural factors reach the child only as sifted through the behaviors of individuals to him. This is gradually replaced by experience of factors from multiple sources. The period of "sheltering" varies not only from one individual or one family to the next but also from one culture to the other. The Sikh child at the age of three, for instance, is normally allowed opportunities for personal exploration of his physical and social environment which are denied to American children except under the most unusual conditions of urban deprivation or rural isolation. By six or seven the Sikh male is regularly permitted an amount of freedom of movement often denied to Americans right through their adolescence: he may go unattended beyond the confines of his home and village, and he may be away from home at meal times or overnight without previous warning and without occasioning undue comment. To equate the self-reliance of the Sikh and American in terms of chronological years is thus impossible. The aspect of these experiences to which I am here calling attention, however, is the degree to which they tend to reinforce each other. Do his early experiences with individuals agree with what he later hears as precepts or preferred behaviors? Do these, in turn, correspond to his personal observations of events and conditions? Do religious practices involve adaptations similar to those required by legal sanctions? It may even be postulated that behavior depends as much on the relation which such various facets of training bear to each other as on the nature of each facet taken separately.

The extent to which the principle of reinforcement differs from reinforcement theory as usually discussed will now be clear. It is unfortunate that a less confusing term has not presented itself. But the commonplace meaning of "reinforcement" is so much more readily applicable to the principle suggested here than to the reinforcement in learning theory that ultimate confusion may be successfully avoided. Benedict's reference to "continuity and discontinuity" (1) in cultural conditioning provides another possible term. Since, however, she is referring particularly to discontinuity of role and the term implies a uniquely temporal orientation, as between childhood and adulthood, it has not seemed wise to adapt it for the present purpose. When Benedict speaks of the child being "nourished by continuous experience" (p. 163), we are certainly dealing with the same mechanism. Her attention, however, is focussed upon continuities between total syn-

MARIAN W. SMITH

dromes of expected behavior and their effects, whereas this paper concentrates on relationships which exist between aspects of training in setting up those syndromes and on the mental health of the individual so affected. As child training mechanisms become clearer, there seems little doubt that the connections between these will be clarified and a single term can be substituted.

This brings us back to the consideration of Dennis' cases of wild children. Whether or not they have been raised by animals seems, in view of the evidence, to come down to a matter of personal faith. One believes or does not believe in feral children in this sense. Nevertheless, if the data are accepted on their face value for purposes of argument, I would agree with Dennis that they say little as to the *nature* of the child training involved. They do, however, say considerable as to the *relationship* between one and the other sets of training. These cases surely represent the ultimate in non-sequitur, or contradictory, nurture. They furnish an example of complete absence of reinforcement. Presented with such severe and sudden contrast, the human organism seems capable of learning enough new behaviors to continue its physical existence. But when the second set of conditions continues for a considerable period, without any reinforcement of the earlier learned responses, the organism seems to suffer permanent effects. Perhaps the shift has been too drastic and too long sustained for any far-reaching rehabilitation to be possible.

However this may be—and I certainly hesitate to conclude anything from these cases—the relevance of the feral child to psychological theory seems to be less in illustrating the absolute importance of early training than in pointing up the need for, and positive value of, reinforcement in child development.

REFERENCES

1. BENEDICT, R. Continuity and discontinuity in cultural conditioning. *Psychiatry*, 1938, 1, 161-167.
2. DENNIS, W. A further analysis of reports of wild children. *Child Develpm.*, 1951, 22, 153-158.
3. DENNIS, W. The significance of feral man. *Amer. J. Psychol.*, 1941, 54, 425-432.
4. EMEMEAU, M. B. A classical Indian folk-tale as a reported modern event. *Amer. Phil. Soc., Proc.*, 83, 503-513.
5. SINGH, J. A. L. and ZINGG, R. M. *Wolf-children and feral man*. New York: Harper, 1942.
6. SMITH, M. W. Kota texts: a review of the primitive in Indic folklore. *J. Amer. Folklore*, 1948, 61, 283-297.

THE HISTORY OF THE

... of the ...

... of the ...

... of the ...

... of the ...

... of the ...

... of the ...

... of the ...

... of the ...

POSSIBLE CAUSES OF OVERDEPENDENCY IN YOUNG CHILDREN¹

CELIA BURNS STENDLER²

Bureau of Educational Research, University of Illinois

The American socialization process emphasizes the learning of independence in the childhood years. Perhaps more than in other societies, standing on one's own feet, being able to fend for oneself is an important characteristic of the socialized person in our society. Beginning in early childhood we systematically train our children to attend to their physical needs by themselves (feeding, dressing, toileting), to learn to get along without the mother's continual presence and to learn to take a certain measure of hardship without turning to the socializing agent for help or comfort.

But the American socialization process also emphasizes dependence. American parents want their children to turn to them for guidance and to accept their instructions as they attempt to induct the young into the mores of society. It is important for our children to learn a dependency drive—to learn to solve some problems by turning to the adult because the adult knows the approved ways of behaving. Successful socialization, then, involves the acquisition of a culturally approved balance between dependency and independence.

Not all children learn the proper balance between these two drives. Some children become overly-dependent upon mother or mother substitute. These are the children who continually seek out adults for their presence, their help, or their approval. They find it hard to grow up and cling tenaciously to their mothers for support.

This paper is concerned with causes of overdependency. It reports the results of a study in which 20 young children (six-year-olds) who were rated as being overdependent were compared with 20 young children who served as controls. Two hypotheses were advanced to explain overdependency and each of these was tested in the study:

1. Overdependency results from a non-permissive approach to infant disciplines. During the past decade an articulate group of neo-Freudians has advocated a permissive approach to feeding, weaning, toilet training

¹ This research was supported by a grant from the Bureau of Educational Research, College of Education, University of Illinois.

² The writer is especially indebted to Mr. Edward Clifford, Institute of Child Welfare, University of Minnesota, for his invaluable help in planning and executing this study.

CHILD DEVELOPMENT

and the like, and has attempted to establish a relationship between a non-permissive approach and later personality difficulties. The question for us in this study was: Will a non-permissive approach to infant disciplines result in overdependent children?

These basic assumptions underlie the second hypothesis:

- a) Dependency is a *learned* drive.
- b) Independence is a *learned* drive.
- c) Overdependency represents an overly strong dependency drive and a correspondingly weak drive toward independence.
- d) There are critical periods during infancy for the learning of dependency.
- e) Anxiety can serve to strengthen the dependency drive.

Our second hypothesis which rests upon these assumptions is:

2. Overdependency results from either of the following conditions:
 - a) Where a child is consistently rewarded for turning to the mother for help, and punished or non-rewarded for independent actions; (i.e., he has an overprotecting mother).
 - b) Where a child meets so many tension-producing situations during the critical period in learning dependency that his dependency drive is reinforced to the point where it is overly strong.

These two hypotheses need further elaboration which follows:

Infant Disciplines and Overdependency

Infant disciplines have been suggested by some authorities as a possible factor in causing overdependency. They point out that every child regardless of the society in which he is reared is exposed to certain training situations such as weaning and toilet training in the process of socialization. Furthermore, they argue, these training situations are the seedbeds of emotional conflicts. Following in Freudian footsteps, they point out that severe conflict during these early training situations may cause a total arresting of development or the retaining of more characteristics of earlier stages of development than is normal. Thus extreme oral deprivation during the oral stage of development might result in a person becoming "fixated" at that level of development. When this happens, the person "will, in his general behavior, present a disinclination to take care of himself, and require others to look after him. . . . Persons of this type request and demand a great deal, will not relinquish their object and affix themselves by 'suction'" (3, p. 489). Overdependency according to Fenichel might result from a person being fixated at the oral stage of development because of extreme oral deprivation, or for some other reason. He describes a case:

A case of this kind had had several oral-fixating experiences. He was breast fed for a year and a half, while living with a doting grandmother

CELIA BURNS STENDLER

who spoiled him in many ways; then he was suddenly removed and lived with his excessively severe father. The result was a character governed by one predominant motive: to be reimbursed by his father for the oral gratification of which he had been deprived. Failing in this, he resorted to force to regain it. The patient had no occupation. He lived on his father's money and persistently considered himself discriminated against by his father. The conflict between the tendency to respond to disappointment by applying violent measures (to take by force what does not come automatically) and the simultaneous tendency toward ingratiating submissiveness is characteristic for oral fixations (3, p. 489).

Some writers also in the Freudian tradition emphasize the frustration which may be produced in the early training situations as leading to overdependency. They point out that such practices as feeding babies by the clock, weaning them too early or too abruptly or toilet training too early and too severely may cause insecure and anxious children, some of whom may be overdependent.

Underlying the assumption that these training situations are crucial is the belief that it is frustrating to the infant if he is trained early and not so frustrating if the training occurs later. Infants require a certain amount of sucking, the argument goes; to be deprived of sufficient sucking experience by too early weaning is thwarting to the child. Similarly too early toilet training is thwarting since the child is being required to do something for which he is not physiologically prepared. The resulting frustration might make children stubborn and aggressive at a later age as a result of their battles over weaning and toilet training. On the other hand, if the child resolved the conflict by giving in to the will of others he might develop an overdependent personality.

Overdependency as Learned

To understand overdependency as learned behavior, we need to trace the course of this learning, and to consider first what the infant brings with him into the world in the way of needs or drives.

According to the learning theorist, some drives can be found within the child from birth. Hunger is an example of a very powerful need or drive with which the infant is born. We say it is a drive because it motivates the infant to activity. It represents a state of disequilibrium or tension within the organism. When this state of disequilibrium arises, the infant is motivated to act; he may cry, thrash about and suck his fingers as a temporary means of relieving tension, and he will reduce his activity, be relaxed and sleep after he has been fed and physiological equilibrium restored to the body. Similarly there are activity drives which originate in the muscles attached to the skeleton. Disequilibrium or tension arises when the individual maintains a particular posture for a period of time; this tension is reduced by changing the position of the body or of some one part of the

CHILD DEVELOPMENT

body, as for example, by shifting weight from one foot to another. In addition there are drives which may be classed as sensory and emotional in nature which again serve to motivate the individual to some kind of activity.

But man is not only motivated to act because of certain primary drives; in infancy he begins to acquire other motives which also impel him to act. This he does through a process of learning; the new motives are called secondary drives or learned drives. The young baby touches a hot stove; his body is thrown into a state of tension which is reduced as the baby withdraws his hand and the pain subsides. The next time the baby approaches the stove, even without touching it, the same state of tension may arise within his system and the baby may back away before he actually experiences pain. Now it is fear rather than pain which causes him to act. We may say of his behavior that he has learned the drive we call fear and that this drive may motivate him to withdraw from stoves in the future.

Even during infancy emotional drives other than fear are learned. One of the most basic of these from the standpoint of later personality development is that of dependency. Now we shall trace the beginnings of this drive as well as some of the conditions which modify its strength.

The Process of Learning Dependency

As we have already pointed out, the human infant is born with a hunger drive. The infant must have food to survive; when his stomach is empty the need for food gives rise to a stimulation or drive state which typically takes the form of restless or crying behavior. We may say the infant has a hunger drive which motivates his behavior. This restless or crying behavior will cease when food is swallowed and the hunger drive reduced.

The infant, however, is capable of learning and by a process of conditioning he comes to respond to certain cues which stop crying and the thrashing about before the food is swallowed. Probably the first cue that he learns is that of the feel of the nipple in his mouth. Because this sensation occurs with reduction of the hunger drive it quickly becomes the cue to which he responds by ceasing crying.

The next step in the learning of dependency is that which takes place when the infant stops crying and begins making sucking noises upon being picked up. A new cue has been added to his repertoire. Now it is no longer necessary for food to begin its way to the stomach for tension to be reduced or for the infant to feel the nipple in his mouth, for the cue of being picked up has become the signal for the reduction of the hunger drive. Gesell (4) notes that by four weeks of age cessation of crying on being picked up can occur.

Step 3 in the learning process occurs at 16 weeks. According to Gesell (4), this is the age at which the infant quiets when his mother enters the

CELIA BURNS STENDLER

room. Tension reduction now occurs—not on being picked up, not on oral sensation, not on food in the stomach, but with the presence of the mother. As her presence becomes more and more associated with the good things of life, it comes to have reward value for the infant.

Throughout the first year of life the infant shows increasing awareness of the value he attaches to his mother's presence. At twenty-eight weeks he can distinguish his mother from other people and demands more of her than of others. These demands continue as the infant approaches his first birthday; he may cry when she leaves the room or when she turns him over to a stranger to be held. By his demands upon her, he indicates his own recognition of his need for her. When his perception of his need for mother's presence has reached this stage we may safely say he has a dependency drive. Now when faced with a problem which gives rise to tension in the organism, whether it is the toy that lies just out of reach of the playpen, a visitor's strange hat, or hunger, cold and thirst, the infant turns to his mother to solve the problem and reduce the tension. He has a need or drive for her presence and for her help.

The next step in the learning of dependency occurs when the child learns to seek approval and to avoid the disapproval of others. Again this occurs through a process of conditioning. If reduction in tension is accompanied by verbal approval, eventually the child will seek verbal approval as a means of reducing tension. Typically when the mother is trying to soothe the infant she will talk in comforting tones to him. Reduction of his primary needs by feeding, rocking or warming is accompanied by soothing talk of an "approving" nature and eventually such talking comes to seem "good" to the child (7).

But not only is he conditioned to like speech; he is also eventually conditioned to like approving speech and to distinguish between verbal approval and disapproval. When a mother decides not to comfort the child, she will tell him so, frequently in sharp, "disapproving" tones. These sharp "disapproving" tones come to have a negative value for the child since they signify that his primary wants will not be cared for; thus they come to mean a painful rather than pleasurable state of affairs. Just as he learns to want his mother's approval so he learns to avoid her disapproval.

Some children, however, do not have a chance to learn dependency. The kind of conditioning process we have described does not occur, because there is no continuing relationship with one person. These children are very difficult to socialize because they have never learned to want the social approval of others. They are unmoved by punishment. They are driven by inner impulses which demand immediate satisfaction. In turn they cling and then react in very independent fashion. Threats have no effect upon them. Such children have been described by Bowlby (1), by Erikson (2), by Spitz (10) and others who point out that such factors as maternal deprivation are at work here.

CHILD DEVELOPMENT

Some children, on the other hand, become overdependent, as we have already indicated. According to Hypothesis 2, their overdependency may be learned in one of two ways. Where the child from birth is consistently rewarded for being dependent and non-rewarded or punished for being independent, he becomes a dependent, submissive individual. This kind of treatment is typically afforded the child by overprotecting mothers. Levy (6) has described extreme cases where this development has taken place. His overprotected children had excessive contact with the mother; they were still being indulged and waited upon as if they were babies; their attempts at independent behavior were discouraged. Such children may be said to be overdependent because of a deficiency in independence training and because dependent behavior is constantly rewarded.

From observation it becomes apparent that not all children who are overdependent conform to Levy's description, however. Some overdependent children have mothers who are not overprotecting, as were the mothers Levy described. Levy's parents might be said to be the instigators of the overdependency. In some parent-child relationships, however, the mother *unwillingly* accedes to the child's excessive dependency demands and because of her unwillingness is inconsistent in her treatment of the child. The child is the instigator of extreme dependency demands. Also, the child's overdependency does not extend to all areas but is limited to selected ones. Thus the overdependent child of the non-overprotecting mother may insist upon his mother's accompanying him back and forth to school but accomplish such tasks as tying laces at six years of age without demanding help.

Critical Periods in Learning Dependency

It is necessary to elaborate on reinforcement theory to explain how this type of overdependency begins. In a study of ordinal position in the family as a psychological variable, Sears (9) found among other things that the oldest child in the family was more likely to have experienced anxiety in the nursing and weaning situations, and at the same time more nurturance at bedtime and more cautioning about sickness and danger than second and later children. Older children were also rated as the more dependent. Sears suggests that the anxiety produced by frustrations in nursing and weaning serves as the facilitating instigator to whatever behavior has been predominant in those infant situations in which the anxiety was aroused. Thus since dependency behavior is likely to be predominant at the time of nursing and weaning, anxiety produced in nursing and weaning situations will strengthen the dependency needs.

Sears' hypothesis implies two different factors in child training situations which might influence overdependency: (a) the possibility of critical periods in the socialization process and (b) the function of anxiety during one of these critical periods. These two factors we will examine separately.

CELIA BURNS STENDLER

The possibility of the existence of critical periods in the socialization process has been recognized by researchers working with animal subjects. Scott and his associates (8) report:

A number of years ago one of us (J.P.S.) tried the experiment of isolating lambs from their mothers at birth and raising them in association with human beings. At the end of the first 10 days in life they were replaced with the flock but seemed to have undergone a fundamental change in behavior, in that they did not follow the flock and never became strongly associated with it even after several years. This pointed to the major importance of early experience. At a later date the same sort of experiment was repeated with a puppy. In this case it was kept away from other dogs for a period of about nine weeks before it was replaced with its litter, the expectation being that the longer period would have an even more drastic effect. However, after an initial period of fright it soon adjusted itself, and in a very short time its behavior was indistinguishable from that of its litter-mates. The superficial conclusion here would be that early experience has little effect on later behavior. Since that time the careful study at this laboratory of the development of behavior in the dog has led to the hypothesis of critical periods, which may help to explain such different and apparently contradictory results (8, p. 162).

In their study of dogs, these writers were able to identify five distinct periods marked by the appearance of different patterns of behavior relationships:

Period I, the neonatal period. Principal activities—nursing, defecation, urination, crawling, whining. Little or no capacity of learning or memory, hence, Period I is not critical from the point of view of learning capacity. May be critical in that life depends upon successful adjustment to the mother. No evidence of after effects of such experiences as removal from mother, tail docking or operations.

Period II, the transition period. Ten or fourteen days to twenty-one days. Marked by important changes in psychological capacities. Has vastly increased its capacity for associative learning and by twenty-one days can be conditioned very easily.

Period III, the period of socialization. A critical period with regard to the development of social relationships; adjustment to human beings important. Dogs who do not have human contacts during this period become "pathologically" shy. Evidence indicates that disturbances occur more easily at this time and do have definite effects on later adjustments.

Period IV, the juvenile period. Marked by growth, increasing physical skill and increasing independence.

Period V, the adult period. Marked by growth, increasing physical skill and increasing independence.

On the basis of experimental work by these and other writers, it appears that there are special times in the development of dogs which are more

CHILD DEVELOPMENT

important than others. Period III appears to be most critical for social relationships, probably because of the vast change in the capacity for associative learning which occurs at this time.

As we turn to the human sphere we find Bowlby (1) pointing out that there may be critical periods in socialization for the psychological development of the child. He reviews the research on maternal deprivation upon personality development in relation to the time of its occurrence. A child may be deprived of maternal care and affection by (a) having to live with a mother or mother substitute who rejects him or (b) by losing his mother and not having a familiar mother-substitute or (c) being removed from his mother to strangers. He quotes numerous writers who have described the effects of maternal deprivation during the child's early years. There is considerable agreement that the period during which maternal deprivation can seriously handicap a child is limited. According to Bowlby, separation from the mother after six months and up to three years is particularly damaging. Such a separation results in a personality which is asocial, affectionless, uncontrolled, distractible and aggressive. It would seem that a close and continuing relationship with one person during this critical period is necessary if the child is to learn to establish satisfactory relationships with other human beings. This learning is best (and, perhaps, only) accomplished during the critical period.

Similarly there may be a critical period in the socialization process during which time it will be easier for the child to develop overdependency than at other times. To understand how this may happen we need to consider the second factor in the Sears hypothesis: the factor of anxiety. During the latter half of the first year, as already indicated, the time comes when the child has matured sufficiently in his perceptual powers to not only recognize his mother but to recognize that he is dependent upon her. When he arrives at this stage, he will turn to her for comfort and reassurance whenever an unusual state of tension arises within the organism because he has already learned to associate "mother" with tension-reduction. Should environmental conditions be such as to produce many tensions, the dependency drive will be strengthened. In other words, *undue stress toward the end of the first year of life or during the second year may cause the child to turn more and more to his mother and establish habits of overdependency.*

Few children in our society know a stable and continuous environment in every respect. The very fact of raising a child brings changes in the parents which are continuous. Attitudes on the part of the parents toward the child may change; a parent may reject a two-year-old but enthusiastically accept the same child the next year. Some of these changes may come about subtly and gradually so that the child has a period of time in which to accustom himself. Others come suddenly; a beloved grandmother dies. An unknown father appears and a mother who has been mother only suddenly becomes a wife also. A mother goes off to work. The family moves

CELIA BURNS STENDLER

and familiar toys, blankets and bed vanish; new rules and schedule are instituted.

The problem of adjusting to a new situation creates tension within the child. Between the time he first perceives his need for his mother and the time he is more independent in solving problems, he is most likely to turn to his mother when tension arises. A strange person picks him up; he turns to his mother for comfort. He is put to bed in a strange crib; he relaxes only when his mother is sitting beside him. A stranger takes care of him during the day; he cannot tolerate separation from the mother when she returns in the evening. He is mature enough perceptually to recognize changes in his environment; some of these changes are tension-producing; he has learned to depend upon his mother for reduction of tension and so solves his problems in this fashion.

For most children the tension-producing situations which are resolved by dependency are not exorbitant in number. Ideally they are of sufficient number so that the proper amount of dependency will be established, creating a favorable climate for the child's dependence upon the adult in the moral realm. For some children, however, sudden changes of a serious nature and extensive in number may occur during the critical period after he recognizes his need for his mother (nine months average, according to Gesell) and before he has sufficient language ability to be prepared for the changes (after three years). When this happens, dependency may be practiced to the point where overdependency results.

To summarize, the hypothesis stated earlier may be repeated.

1. Overdependency may result from either of the following conditions:

- a) Where a child is consistently rewarded for turning to the mother for help, and punished or non-rewarded for independent actions, (i.e., he has an overprotecting mother); or
- b) Where a child meets so many tension-producing situations during the critical period in learning dependency that his dependency drive is reinforced to the point where it is overly strong.

We now turn to a description of the methods and procedures for testing both the hypothesis that overdependency is related to infant disciplines and the hypothesis that it is a learning phenomenon.

METHODS AND PROCEDURES

Step one in conducting this research was the selection of overdependent children for study. The decision was made to study these children at the first-grade level (age six years plus) because the problem of identification is easier at this point; this is the year when most children leave home for the first time and when evidences of overdependency are most striking. For purposes of selection, an overdependent child was defined as one who

CHILD DEVELOPMENT

depends upon another's presence or help in many areas of behavior where most individuals of that particular age in his particular society fend for themselves. For example, if most six-year-olds in our society feed themselves, then it might be interpreted as indicating overdependency for an able-bodied six-year-old to have to be fed by his mother. The reader will note that this definition takes both societal and developmental factors into account.

Eighteen first grade public school teachers in a small mid-western city helped in the selection of our experimental group. They filled out questionnaires on the basis of the child's need for the presence of the mother outside the school, on the child's need for help and attention in the classroom, and on the mother's tendency to overprotect the child. The questionnaire was as follows:

TEACHER RATINGS OF FIRST GRADE CHILD³

1. Outside of school do you feel that the child wants to be with the mother:
.... 1. All the time
.... 2. Most of the time
.... 3. Some of the time
.... 4. Very little of the time
.... 5. None of the time
.... 6. No evidence—don't know
2. Does the child turn to you for excessive reassurance that he is doing a job right, or to ask for directions:
.... 1. All the time
.... 2. Most of the time
.... 3. Some of the time
.... 4. Seldom
.... 5. Not at all
.... 6. No evidence—don't know
3. Does this child show indications of:
.... 1. Continually wanting help or direction even when he is fully capable of doing the work
.... 2. Usually demanding more help than needed. Seldom will struggle alone on a problem
.... 3. Asking for help only when needed; will try to tackle a job by himself
.... 4. Being independent even to the point of not asking for help or direction when he should
.... 5. No evidence on any of these
4. Do you feel the mother:
.... 1. Continually helps child, even when he is fully capable and willing
.... 2. Usually helps more than needed. Seldom lets child struggle unsuccessfully
.... 3. Helps when needed, but not when child can get by alone
.... 4. Tends to withhold aid, letting child solve own minor problems
.... 5. Leaves child to solve even major problems
.... 6. No evidence on any of these

³ The items in this questionnaire have been taken from many sources. As an example, see: Champney, H. Measurement of parent behavior. *Child Developm.*, 1941, 12, 131-166.

CELIA BURNS STENDLER

5. Do you feel the mother:

- 1. Tends to shelter child from every imaginable slight discomfort or difficulty
- 2. Is not given to inventing imaginary hazards, but does protect from many trivial difficulties which child could handle
- 3. Allows child to be exposed to many minor difficulties, but shelters from serious upsets even if purely temporary
- 4. Lets child face own obstacles when there is no danger of lasting harm
- 5. Exposes child to rather tough situations, unless danger is quite serious or situation acute
- 6. No evidence of any of these

With five points scored on each major item, the most dependent children might have a total score of 25 for all five items. From the 360 questionnaires which were returned, we selected 68, scoring 20 points or more, to follow up in parent interviews. Information on dependency in four different areas was obtained: eating; physical habits (dressing, bathing, sleeping); playing with others; contact with parents. Here were the items on the questionnaire:

ITEMS FROM PARENT INTERVIEW

Eating Behavior:

Does the child feed himself?

How much help do you offer?

At what age was he fairly independent in this respect?

Dressing and Bathing:

Does the child dress and bathe himself?

How much help do you offer?

At what age was he fairly independent in this respect?

Sleeping Behavior:

Where did the child sleep during infancy?

Until what age?

Where does he sleep now?

Did the child ever want to sleep with you?

Does he want to now?

What do you do about it?

Does he ever ask you to lie down with him, or stay with him when he goes to bed at night?

Need for Maternal Contact:

Which of these statements best describes your child:

- 1. Finds it hard to amuse himself. Likes to be near me all the time.
- 2. Likes me to be with him at certain times (like bedtime) but for the most part gets along pretty well by himself.
- 3. Is a very independent child. Does most everything by himself and doesn't seem to need me around.

CHILD DEVELOPMENT

Playing with Others:

Does your child play with other children outside of school?

On the average, how many times a week does your child play with others (not in the family) outside of school?

On the basis of parent responses to questions in these four areas, the number of children rated as overdependent was reduced to 20 and these formed our experimental group. There were 11 boys and 9 girls in the group. For our control group we picked a random sample of children drawn from the first grade population. Various occupations were represented in both groups, with skilled labor and clerical jobs predominating in both.

To test the hypothesis that overdependency results from a non-permissive approach to infant disciplines, we relied upon information obtained in parent interviews. We asked parents to tell us the approximate age at onset of weaning, difficulty of weaning and approximate age at onset of bladder training.

Although infant disciplines may also include scheduling of feeding, thumbsucking, masturbation and cuddling, these were not included in our parent interviews for various reasons. Scheduling of feeding occurs before the onset of overdependency; thumbsucking and masturbation are typically regarded by the infant discipline group as being a result of insecurity not a cause, and cuddling is too difficult to pin down.

For the first part of our second hypothesis relating to overprotection as a cause of overdependency, we attempted to establish criteria of overprotection. In Levy's (6) study of maternal overprotection, he cited three such criteria: (a) infantilization (keeping the child as an infant), (b) excessive contact (mother won't let the child out of her sight), and (c) prevention of independent behavior (refuses to let the child grow up). These three criteria are rather difficult to use in attempting to identify overprotected children for study. As Levy himself points out, they are not mutually exclusive criteria. If one is going to keep one's child as an infant, excessive contact is obviously necessary.

In place of Levy's three criteria, we substituted two, stemming from our theory of how overdependency is learned. We defined overdependent children who are overprotected as children (a) whose dependent behavior is consistently encouraged and (b) whose independent behavior is punished or non-rewarded. These are roughly analogous to Levy's criteria of infantilization and prevention of independent behavior.

1. *Encouragement of dependent behavior (infantilization).* We could not use samples of immature behavior at six years of age to find our overprotected children, for both overdependent subgroups might be expected to behave immaturely in certain respects. Instead, we looked to certain physical habits of younger children—drinking from a cup or glass, using

CELIA BURNS STENDLER

a toilet, and dressing oneself—as habits which normally mothers try to establish in their children during early childhood. We reasoned that mothers who did not try to teach their children habits of independence in two out of three areas within reasonable time limits might be mothers who were encouraging dependent behavior by such means. We defined “reasonable limits” as 14 months for the onset of weaning, 18 months for the onset of bladder training and 4 years of age for expecting a child to partially dress himself; these figures were arrived at arbitrarily after studying some standard guides for child rearing to see what was being advocated at the time.

2. *Prevention of independent behavior.* Here we used evidence with regard to the mother's refusal to let the child play with others, extreme caution about physical needs and the mother's own estimate of her reluctance to let the child grow up.

For the second part of our hypothesis, concerning tension-producing situations during the critical period in learning dependency, we began with a definition of terms. The critical period we had already defined as occurring between 9 months of age and 3 years of age, as explained in our presentation of the theorizing behind this hypothesis. By tension-producing situations, we refer not to the tension which may occur in the organism hundreds of times in the course of daily living, but rather to the tension that may occur in large amounts and over a long period of time due to unusual adjustments which the organism may have to make due to discontinuities in socialization. The loss of sight or some other major change in one's physical orientation to the world may be one such tension-producing event. While such physical disability cases are fortunately rare, four enforced psychological adjustments due to discontinuity are major enough in young children's lives to produce undue tension: (a) the permanent or temporary loss of an important socializing agent, (b) adjustment to a new socializing agent, (c) major changes in the physical environment of the child and (d) major illness. The severity of the discontinuity as well as number of discontinuities were taken into consideration in judging whether an event might be conducive of undue tension or not. Since these judgments had to be subjective and had to be made in the light of each child's background, three different people evaluated events in a child's life to decide whether serious discontinuity was present or not.

RESULTS

Overdependency and Infant Disciplines

As a test of the infant disciplines hypothesis we collected information from mothers about onset of weaning and difficulty in weaning and onset of toilet training for both the overdependent children and the control group.

When we compared our sample of 20 overdependent children with the 20 cases in our control group, we found that instead of being forced to

CHILD DEVELOPMENT

adjust to early weaning, they were actually weaned later than the controls. For our overdependent children, the time of weaning ranged from three months to three years with a mean of 14.4 months. In the control group onset of weaning ranged from five months to eighteen months with a mean age of 11.8 months. Table 1 gives the data on weaning for both groups.

TABLE 1
AGE OF CHILD AT ONSET OF WEANING AND MOTHER'S RATING OF
DIFFICULTY: 20 OVERDEPENDENT CHILDREN AND 20 CONTROLS

<i>Overdependent Child</i>	<i>Age at Weaning</i>	<i>Mother's Rating</i>	<i>Control Child</i>	<i>Age at Weaning</i>	<i>Mother's Rating</i>
John	12	Easy	Dan	7	Easy
Jim	9	Hard	George	6	Easy
Louise	24	Hard	Barbara	10	Easy
Susie	8	Hard	Roger	18	Easy
Will	18	Hard	Daisie	12	Easy
Shirley	24	Hard	Gerald	9	Easy
Robert	14	Easy	Vickie	9	Easy
Betty	9	Easy	Charles	10	Easy
Jane	9	Easy	Judith	12	Easy
Eliza	14	Easy	David	12	Hard
Lulu	18	Hard	Ed	5	Easy
James	15	Easy	Mike	18	Hard
Lee	3	Easy	Geraldine	10	Hard
Sarah	11	Hard	Priscilla	12	Easy
David	8	Easy	Bruce	16	Easy
Bob	18	Hard	Vincent	8	Easy
Katherine	12	Easy	Maria	16	Hard
Ronnie	15	Easy	Anna	18	Hard
Barnie	11	Easy	Veronica	10	Easy
George	36	Easy	Jessie	18	Hard

We next analyzed our data to see whether there was any difference between our sample and our control group in strength of frustration as indicated by the mother's evaluation of the difficulties encountered in weaning. Mothers were asked to rate the weaning as difficult, easy or in-between. A mother's evaluation of weaning as hard was interpreted as indicating greater frustration on the part of the child than if the mother described the situation as easy.

Again our analysis indicated little difference between our two groups of children with respect to weaning difficulties. Eight out of twenty mothers

of overdependent children described the weaning situation as hard, while the remaining twelve considered that their child had easily made the shift. In our control group there were six mothers whose children had had difficulty and fourteen whose children had had an easy time in weaning. It would appear that strength of frustration during the weaning period is not an important factor in causing overdependency.

We might note here in passing that our data provided further evidence that early weaning is not necessarily more frustrating than later weaning. In a report of a study on the relation of cup feeding in infancy, to thumb-sucking and the oral drive, Sears and Wise (9) hypothesized that securing food by sucking increases the oral drive. Therefore, the longer the child's experience in sucking the greater will be the frustration reaction to weaning and the more likely it is that the child will suck his thumb. Their evidence tended to substantiate this hypothesis, with more thumb-sucking occurring in the late-weaning group.

Fourteen of our mothers (both groups) reported difficult weaning; of these fourteen, eight weaned late—indeed, as late as two years of age. Twenty-six mothers reported easy weaning; of these, eighteen were weaned during the first year of life, including one at three months of age. Like the children studied by Sears and Wise, our children did not necessarily find early weaning more difficult nor late weaning easy. The bulk of our easy weaning cases fell between ten and fifteen months.

We might also note here the observation by Sears and Wise that "The finding that early weaning causes less frustration reaction than late weaning does not conflict with any previously established facts. It has been commonly thought that Levy's (5) original finding of more thumb sucking in children who had inadequate sucking opportunity required the assumption of an inborn or primary oral (sucking) drive. This does not necessarily follow. All of Levy's subjects had been fed by sucking, and therefore they belonged in the 'middle'- or 'late'-weaned groups as these have been defined in the present study. Once a child has had his sucking drive strengthened by practice, the amount of substitutive sucking would be expected to increase with interference in nutritional sucking. This is what Levy found." (9, p. 137).

Our overdependent children then were weaned at approximately the same age as our control group and did not experience undue hardship in the weaning process, as reported by mothers. Data on onset of bladder training yielded the same results when means were compared. Overdependent children began bladder training at an average age of 10.9 months while our controls began at 10.7 months. The spread of the two groups, however, was quite different. We had more mothers at both extremes (early trainers, 6-8 months and late trainers over 14 months) in our overdependent group than in our controls. By and large the overdependent group who were overprotected made up the late trainees.

CHILD DEVELOPMENT

On the basis of our evidence concerning weaning experiences and onset of bladder training we rejected the hypothesis that overdependency results from a non-permissive approach to these particular infant disciplines. We will consider next evidence bearing on our second hypothesis.

Overdependency and Overprotection

Support for the hypothesis that overprotection may result in overdependency comes not so much from our research as from Levy's (6). In his study of 20 cases of maternal overprotection, he found 8 children who showed "an excessively submissive relation to the mother, are obedient to her, and very dependent" (6, p. 39). Where maternal control was lacking, as in 11 cases, an undisciplined child was the result. In other words, in those cases where overprotection and maternal domination are combined, the result is overdependency.

Our approach to the problem differed from Levy's in that our focus was on overdependency (which is child-oriented) whereas Levy's was on overprotection (which is mother-oriented). It was our thesis that *some* (not all) overdependent children are that way because of overprotection. These are the children whose parents *want* them to be dependent and whose dependent behavior is consistently encouraged (infantilization) and whose independent behavior is consistently punished or non-rewarded.

When we examined our cases for evidences of overdependency stemming from consistent overprotection, we found 6 children whose mothers met the criteria of Infantilization and Prevention of Independent Behavior. Data on these 6 cases are summarized in Table 2. The reader will note that these 6 cases met the criteria for Infantilization in two out of the three categories. Comments from the parent interviews have been included here to illustrate how mothers prevent the learning of independent behavior by their refusal to let the child play with other children, their extreme caution about physical needs, and their desire to keep the child physically close.

In sharp contrast to these 6 cases were our remaining 14 children who met the criteria for overdependency but who did not meet the criteria for overprotection. Two things seemed to distinguish this group. With respect to physical habits they were not dependent as was our overprotected group. They learned to feed themselves, to dress themselves, to tie their shoelaces and to help with chores around the house, activities which typically were done in the mother's presence or under her supervision. But when it came to doing things without the mother's presence these children were very dependent. They wanted the mother when they went to bed at night and when they went back and forth to school; they balked at activities such as playing outside the home which would take them away from her presence and they made a scene whenever the mother had to go out and leave them. It was the mother's presence they needed, rather than aid; they might be said to be emotionally dependent rather than physically.

CELIA BURNS STENDLER

TABLE 2

EVIDENCES OF OVERPROTECTION IN 6 OVERDEPENDENT CHILDREN

Case	Evidences of Infantilization			Evidences of Prevention of Independent Behavior <i>Mother's Comments</i>
	<i>Onset of Weaning</i>	<i>Onset of Toilet Training</i>	<i>Independence in Dressing</i>	
Eliza ...	14 mo.	16 mo.	Mother dresses at 6 years	She's our only child and I've given all my time to her. She doesn't need other children. I watch her very carefully and don't let her do some things; that's why she's never had any accident.
Robert ..	14 mo.	16 mo.	Independent	He's mother's boy. I like him to stay close to me. That way I know what he's doing. I don't send him to kindergarten because they catch everything there.
James ...	15 mo.	14 mo.	Mother dresses at 6 years	I don't send him on any errands. He's too small for that. They grow up and get away soon enough as it is. I know I give him too much time and attention but they're only young once.
Ronnie ..	15 mo.	9 mo.	Dependent	I've always kept him near me from the time he was born. Even when his younger brother was born he never seemed to need the attention this one does. I watch him pretty carefully and don't let him run with the others.
Louise ..	2 yrs.	16 mo.	Independent	I like to keep her with me. She always goes where I go. I like to raise her just right and if she gets to going with other kids she'll learn rough ways.
George ..	3 yrs.	14 mo.	Mother dresses at 6 years	His older brother is 27 years old. I guess I've spoiled him. I hated to send him to kindergarten, he seemed such a baby. I drive him back and forth to school each day. It's safer that way.

The other way in which our overdependent group which was not over-protected differed from the group which was had to do with maternal attitudes. The mothers' comments quoted in Table 2 show clearly that these mothers were interested in preventing independent behavior; they wanted

CHILD DEVELOPMENT

dependent children. The mothers in our second group, on the other hand, were disturbed over the fact that their children were overdependent and they tried to force independent behavior. They had children in whom the dependency drive was so strong that the children made excessive demands upon the parent. To find why the drive in these children was so strong we looked not to maternal overprotection, but to the testing of the second part of Hypothesis 2, that discontinuity in the socialization process during the critical period in learning dependency might result in reinforcement of the dependency drive to the point where it is overly strong.

Overdependent Children Who Were Not Overprotected

From the life histories of our two groups of children as reported by mothers we attempted to arrive at some measure of the major adjustments these children had been called upon to make during the critical period. As indicated previously, there were four adjustments we defined as conducive of undue tension—loss of socializing agent; adjustment to new socializing agent; major change of physical environment; major illness. Three raters working independently arrived at an estimate of the number of major adjustments in each child's life. Agreement among raters was 82 per cent. Here are excerpts from parent interviews which illustrate data which were evaluated:

Case (John)

Lived with mother and grandparents for eighteen months. The father returned and family (minus grandparents) moved to different city. Mother reports "I give him all of my time and attention and so did his grandparents. He was terribly spoiled when his father returned. His father made me realize I'd been spoiling him so I tried to quit. It seemed the harder I tried, the more demanding the baby got."

Case (Jane)

Grandmother who lived nearby very fond of the baby from birth. Mother took the baby over to the grandmother's house every morning after breakfast to stay until late afternoon or evening. The grandmother loved caring for the baby. The mother who had her hands full with three other children and a husband who sometimes lived with the family but who deserted them often for long periods of time, liked this arrangement. Spent every day with grandmother until almost two years of age when grandmother died. Sibling born immediately after grandmother's death.

Case (Susie)

Father not in the picture; parents divorced. Mother lived in a home with the child for six months. Then moved to grandmother's. Mother went back to work and grandmother cared for child. Mother left town to work in another city when baby was nine months old. Came back for the baby and kept her for a while. At fourteen months child returned to grandmother's.

CELIA BURNS STENDLER

Case (Betty)

No moving about. Has always lived with both parents. Husband's father in bed and mother had to care for him so child didn't get much attention. Mother did the best she could—gave in to the child when she couldn't talk her out of something.

Case (Will)

Lots of attention the first year. Mother went back to work at fourteen months. Grandmother came to live with family and care for child. Regression in toilet training at this time.

Case (Sarah)

Lived with mother and grandparents first six months. Then from pillar to post, following father in army camp for six months. New sibling when child one year old.

Case (Shirley)

Seven moves in six years. Mother's mother lived with them for eighteen months while father in service; gave child lots of time and attention. Mother out of home a good deal—working or with husband at camp. Grandmother died at eighteen months.

Case (David)

Lived with maternal grandparents seven months while father in service, then paternal grandparents till eighteen months, back to maternal grandparents till father's final return at twenty-two months. Sibling at twenty-four months. Mother did not get along with paternal grandparents and much dissension over child.

Case (Katherine)

Moved seven times during first three years. Father in service, out of service, in service again. Child given all mother's time and attention when father away; mother devoted herself to father when he was present.

Case (Lulu)

No discontinuities in early life. Father in service but mother maintained home while he was away.

Case (Bob)

Mother went back to work when child was less than a year old. Casual care from that time until two. Parents separated at two; child went to live with grandparents. Mother now in another city.

Case (James)

No discontinuities in early life. Always lived with parents. No siblings. Mother always home.

Case (Barnie)

First ten months of life fairly regular; father away, lived with his sister. Next ten months of life very irregular. Mother left child with grandparents at ten months, went to husband's camp. Returned; child and mother moved

CHILD DEVELOPMENT

back with husband's sister. Mother took a job. Pattern repeated five times until father returned at twenty months.

Case (Lee)

Father in service when child was born. Lived with maternal grandparents. Mother a daughter rather than a mother. Grandmother played role of mother. Father hospitalized; home for visits; when dismissed, mother, father and child set up own home. Sibling born just prior to father's final return. Lots of time and attention while with grandparents. Father upon return complained child was spoiled and insisted upon his being more independent.

When number of discontinuities in our two groups was compared, we found that our 14 overdependent children who were not overprotected experienced an average of 3.9 major adjustments. In fact, 11 out of our 14 children in this group had suffered storm and stress during the critical period for the learning of dependency. By contrast, our control group yielded an average of 1.3 discontinuities, with only 6 children in the group affected during the critical period. The evidence is clearly in the direction of major adjustments faced by the child from 9 months to 3 years as contributing to the strengthening of the dependency drive.

One additional factor should be noted. The mothers of our overdependent children tended to be less consistent in dealing with behavior difficulties than the mothers of our controls. In response to questions concerning their handling of children's demands, these mothers reported, "I held out as long as I could; then I gave in to him, if I had to. Sometimes I won; sometimes he won." Sometimes, in other words, the child's dependency demands were rewarded and sometimes they were not. As we have already indicated, responses which are inconsistently reinforced are difficult to extinguish.

However, it should be pointed out that the child who is experiencing undue tension in his life is going to turn to the socializing agent for tension-release (provided he has learned dependency) *more often* than the child whose life proceeds with only normal frustrations. Even without an overprotecting mother or an inconsistent one he is likely to receive more help and attention from his mother (unless she is a rejecting parent) simply because he asks for more. His dependency drive stands a better chance of being strengthened through reinforcement than the child who doesn't ask for as much help, but who gets satisfaction in doing things by himself.

Family Factors in Overdependency

The question is frequently raised by parents as to whether or not more only children are overdependent than children with siblings. On the surface it would appear logical to assume that the mother of an only child would have more time to satisfy her child's dependency demands than the mother of six children. While our sample was not big enough to adequately

CELIA BURNS STENDLER

test this hypothesis, nevertheless it would appear that size of family per se is not an all-important factor. We had but 4 only children in our experimental group; we also had only children among our controls. We had one overdependent child who came from a family of five children and whose busy mother still found time to give her the time and attention she wanted. Family size in both groups averaged between two and three children.

Presence of the father, however, particularly during the critical period, would seem to be an important factor influencing dependency learnings. Of our 20 overdependent children, 13 lacked the continual presence of the father in the home during the first three years of life. In two other cases, the father while present in the home was a weak socializing influence. In our control group, only 6 of the children had experienced the temporary absence of the father and then only for a short time.

It is easy to understand how a father's presence might influence the learning of overdependency. The American father typically discourages dependency in his children (particularly the male child) and encourages independence. He keeps the mother from reinforcing dependency by his warnings—"You're making a baby out of him," "You're spoiling him by giving in so much,"—and he also teaches independence positively by encouraging the child to stand on his own feet—"You can do it, Pat." "Let's see what a big girl you are now to help Mother." Furthermore because he is away from home for a large part of the child's waking hours and therefore not as closely involved in the socializing process, he can be more objective about it. It is possible for him to note dependency trends that might go unnoticed by a mother who does not have the help of an interested but perhaps more objective participant.

CONCLUSIONS

Our evidence leads us to seriously question whether certain of the infant disciplines such as early weaning, difficult weaning or toilet training will result in overdependency. Our study did yield further data to support Levy's thesis that overdependency can result from maternal overprotection. However we also found evidence to support our thesis that overdependency can result from serious discontinuities in the socialization process during a critical period (9 months to 3 years) in learning dependency.

This last finding raises the question as to the extent that babies should be protected from discontinuity. Should the chance for a Fulbright year in Paris be postponed because it might have an adverse psychological effect upon Junior? Obviously the answer is no. A father who comes and goes, a grandmother's death, a mother going back to work or a major change in physical environment does not *have* to result in an overdependent child. However, mothers need to be prepared for the fact that major upheavals during the critical period *will* result in the child's turning more and more

CHILD DEVELOPMENT

to the socializing agent for help. It is how the mother handles the increased dependency demands that determines whether or not the child will be over-dependent. If she is inconsistent and sometimes says yes but sometimes says no to the same demands, the drive will be strengthened. If she always says yes the drive will be strengthened. Where the child is facing a major adjustment, the mother should recognize that he needs more help from her and she should be prepared to give it. But she should also watch for those behaviors where the child is showing independence. By rewarding these with her approval and praise she can reinforce the drive for independence. And as doing things for himself becomes more and more pleasurable to the child, his dependency demands will decrease.

REFERENCES

1. BOWLBY, J. *Maternal care and mental hygiene*. Geneva: World Health Organization, 1951.
2. ERIKSON, E. H. *Childhood and society*. New York: Norton, 1950.
3. FENICHEL, O. *The psychoanalytic theory of neurosis*. New York: Norton, 1945.
4. GESELL, A. and ILG, F. L. *Infant and child care in the culture of today*. New York: Harper, 1943.
5. LEVY, D. M. Fingersucking and accessory movements in early infancy. *Amer. J. Psychiat.*, 1928, 7, 881-918.
6. LEVY, D. M. *Maternal overprotection*. New York: Columbia University Press, 1943.
7. MOWRER, O. H. Speech development in the young child: I. The autism theory of speech development and some clinical applications. *J. Speech and Hearing Disorders*, 1952, 3, 263-268.
8. SCOTT, J. P., FREDERICSON, E., and FULLER, J. L. Experimental exploration of the critical period hypothesis. *Personality*, 1951, 1, 162-183.
9. SEARS, R. R. and WISE, G. W. Relation of cup feeding in infancy to thumb-sucking and the oral drive. *Amer. J. Orthopsychiat.*, 1950, 20, 123-138.
10. SPITZ, R. A. "Hospitalism." *Psychoanalytical Study of the Child*, 1945, 1, 53-74.

THE ADJUSTMENT OF TWO-YEAR-OLDS IN A NOVEL SOCIAL SITUATION¹

GLEN HEATHERS

The Fels Research Institute for the Study of Human Development

An important indication of social adequacy in young children is their readiness to cope with situations away from home when their mothers and other family members are absent. This study is concerned with the adjustment of two-year-olds to the experience of being separated from home and mother and driven to a nursery school. The situation the children faced involved being taken from home by a woman who was a stranger to them and riding away with other children who were also strangers. This experience not only called for adjusting to a novel social situation but also required the children to face it without the security-giving presence of their mothers.

Novel situations tend to be threatening to children, although the reasons for this are not well established. Arsenian (1) proposed that novel situations make children insecure both because their perceptions of the situation are relatively "unstructured" and because they are uncertain of their capacities to deal with problems which may arise in the situation. Obviously, with repeated experiences in a situation, feelings of insecurity associated with novelty are replaced by feelings of security or insecurity which reflect rewarding or punishing aspects of those experiences.

Usually, a young child's mother is his primary source of security in coping with problem situations since she has been involved in meeting his needs in a great variety of situations and since the child can predict her reactions to him with considerable success. Arsenian (1) demonstrated the security-giving value of the mother's presence in her study of children's reactions to being in a strange room. She found that insecurity was highest

¹ The writer wishes to acknowledge assistance from members of the Fels Psychology Department, in particular Dr. Virginia Nelson, Dr. Joan Kalhorn Lasko, and Mrs. Anne Preston.

CHILD DEVELOPMENT

when the children were alone in the room, less when a familiar "mother substitute" was present, and least when the child's mother was present. Liddell (8) demonstrated a similar phenomenon in goats in a study which compared responses of kids in an experimental situation with and without the mother goat being present.

The current study has four purposes: (a) to offer a measure of emotional upset in children on the trip to nursery school, (b) to examine age differences in upset by comparing responses of younger and older two-year-olds, (c) to relate trip upset to measures of social adequacy in nursery school play, and (d) to investigate relationships between trip upset and certain characteristics of home atmosphere and maternal behavior.

In a study reporting data from Harvard's Center for Research in Child Health and Development, Shirley (10) employed an eight-step behavior rating scale to measure adjustment during the trip to the Center. In the present study an eighteen-item behavior check-list was used to provide a more specific and more objective record of upset responses than Shirley obtained.

In a previous study with grade school children (5), the writer found age differences in adjustive responses to a novel physical threat situation were minimal on the first experience with the situation when novelty was maximal. On later trials, age differences were larger and favored the hypothesis that, once children know what to expect in a situation, older children adjust better than younger children through applying knowledge and skills derived from their more extensive previous experiences. Arsenian, however, did not find such age differences in children ranging from eleven to thirty months of age during repeated experiences with a strange situation. Shirley suggested that older children may be less adjusted than younger children on repetitions of a "dreaded" situation since their "increased maturity" may make them more aware of the hazards they are about to experience again. The present study offers an opportunity to examine age differences in adjustment to a repeated situation with children ranging from 23 to 37 months of age.

If upset on the trip to nursery school is an indication of general social inadequacy, it should predict social inadequacy in situations such as nursery school play. In a previous article (6), the writer offered a number of measures of nursery school behavior which were interpreted as signs of social inadequacy. According to the analysis presented in that article, social inadequacy is shown in children who are inactive a relatively high proportion of the time, who play relatively little with other children, and who are relatively unassertive when interacting with other children. Also, social inadequacy may be shown through an emphasis on "passive" or "infantile" dependence on teachers or children in the form of clinging or affection seeking rather than in the form of attention or approval seeking. The present study tests the prediction that high trip upset is associated with high

GLEN HEATHERS

social inadequacy in nursery school play as indicated by the measures referred to above.

During the child's earliest years, home influences are paramount in preparing him to adjust to various situations. The present study examines relationships between upset on the trip to nursery school and four aspects of the home environment: harmony in the home, sociability of the family, maternal warmth and maternal indulgence. These were rated on the Fels Parent Behavior Rating Scales (3, 4).

Assuming that *harmony in the home* is conducive to emotional security in the child, it was predicted that children from relatively well-adjusted homes would be less upset on the trip to nursery school than children from relatively maladjusted families.

Sociability of the family, involving contacts with people outside the family, was assumed to provide children with opportunities for learning to adjust to novel social situations. Accordingly, it was predicted that high sociability of the family would be associated with low upset on the trip to nursery school.

Most students of personality development assume that *maternal warmth*, as expressed in acceptance of the child, in affectionateness or in approval, is conducive to general security and adequacy in the child. Evidence in support of this assumption was offered by Shirley (10) who reported that children whose mothers were rejecting were more upset than other children while facing test situations in the absence of their mothers. However, in his study of the effects of home environment on children's social behavior, Baldwin (2) failed to find significant relationships between maternal warmth as rated with the Fels scales and aspects of nursery school behavior. The present study offers a further test of the prediction that maternal warmth favors emotional adequacy of children in facing novel social situations.

The effects of *maternal indulgence* were studied extensively by Levy (7) who found that overprotected children tended to be socially inadequate and characterized by sensitivity, shyness and dependence on their mothers. Shirley (19) reported that overprotection tended to produce inadequacy in facing test situations. Levy interpreted the positive relationships he found between overprotection and social inadequacy as resulting from limitations placed on the child's opportunities for learning to cope with situations by himself.

With ratings employing the Fels scales, predicting the effects of maternal indulgence is complicated by the fact that the three measures of indulgence—babying, protectiveness and solicitousness for the child's welfare—are positively correlated with measures of maternal warmth. Insofar as maternal indulgence reflects restricted social learning experiences, one would predict a positive relationship between indulgence and upset in novel social situations. Insofar as indulgence expresses a kind of maternal warmth, a nega-

CHILD DEVELOPMENT

tive relationship would be predicted. It follows that the relationship between Fels ratings of maternal indulgence and upset on the trip to nursery school may be negative, zero or positive depending on the relative strengths of the two opposed factors.

SUBJECTS

The subjects were 31 children who attended the nursery school at the Fels Research Institute daily for four weeks as members of two-year-old groups either in 1949 (seven children), 1950 (nine children), 1951 (ten children) or 1952 (five children). At the time of the nursery school visit, the children's ages ranged from 23.1 to 37.1 months, with a median age of 29.0 months. The seventeen boys had a mean age of 29.2 months, the fourteen girls, 28.8 months. The children were of middle-class origin with their fathers engaged in farming, skilled trades and the professions. The children's IQs (Revised Stanford-Binet, Form L, administered at thirty months of age) ranged from 100 to 167 with a median of 120.

METHOD

Measuring Trip Upset

One requirement for collecting trip upset data was that the circumstances of the trip to Fels be as similar as possible for the different children. With this requirement in mind, the child's mother was asked to part with him at the door and to let the Fels Trip Observer take him out to the car. The Trip Observer, insofar as possible, followed a standard procedure in taking the child to the car, supervising him during the trip, and taking him into Fels. The car was driven by a Fels staff member who had minimal interaction with the children during the trip.

The children had some basis for anticipating what was in store for them since their mothers told them they were going to nursery school and tried in their own ways to prepare their children for the new experience. All the children were familiar with Fels since they had had physical, medical and psychological examinations at Fels when three months old and, beginning at six months, at semi-annual intervals. On the occasion of these visits, their mothers had accompanied them.

In recording her observations, the Trip Observer filled out a check-list which contained behavioral items relevant to the child's adjustment while leaving home and mother and riding to Fels. Separate sections of the check-list covered behavior from home to car, during the first five minutes in the car, and upon arriving at Fels and entering the building.

On each of the first five days of nursery school, the child's reactions during the trip were checked in terms of the eighteen indicators of upset listed below.

GLEN HEATHERS

When taken from home to car

1. Cries
2. Hides, tries to hide, etc.
3. Resists getting dressed to go
4. Clings to mother
5. Calls for mother
6. Tries to go back to house
7. Must be carried to car
8. Resists being carried to car

During first five minutes in car

9. Cries
10. Calls for mother
11. Seeks reassurance or comforting
12. Resists reassurance or comforting
13. Tense, withdrawn or unresponsive

When arrives at Fels and enters building

14. Cries
15. Resists leaving car
16. Must be lifted out, carried
17. Clings to Trip Observer
18. Holds back, reluctant to enter Fels

The child's upset score for each day was the number of the items which were checked. While this method yielded a very crude measure of upset, it had the advantage that the college students available as Trip Observers could be counted on to use the method with reasonable success. Regular Fels staff members could not be employed as Trip Observers because they would not have been strangers to all of the children.

Measuring nursery school behavior

One purpose of this study was to relate trip upset to the children's nursery school behavior. In connection with research on emotional dependence and independence, detailed time-sample observations were made of each child's behavior in the nursery school. These observations were scored in terms of fourteen behavioral categories which involved types of play activities and various forms of dependent and independent responses. The method of observing and scoring these responses was described in a previous report (6). Data involving nine of the fourteen categories of response are used in the present study.

Measuring Home Influences

To obtain ratings of home environment, the Fels home visitor conducted a two-hour visit to the child's home within the two-week period prior to the child's visit to nursery school. The home visitor observed the

CHILD DEVELOPMENT

mother's interaction with the child and interviewed her on topics related to the child's experiences and behavior. On the basis of this visit, the home visitor employed the Fels Parent Behavior Rating Scales to rate general aspects of the home environment and aspects of the mother's ways of relating to the child. These scales, and the method of making and scoring ratings, have been described in previous publications (3, 4). In this study, ratings with nine of the thirty scales were used as measures of harmony in the home, sociability of the family, maternal warmth and maternal indulgence.

TABLE I

MEAN UPSET SCORES ON DAILY TRIPS TO FELS FOR SUBGROUPS IN TERMS OF SEX AND AGE AND FOR THE TOTAL GROUP OF 31 TWO-YEAR-OLDS

Group	N	MEAN UPSET SCORES					
		Day 1	Day 2	Day 3	Day 4	Day 5	Days 1-5
Boys	17	4.18	4.06	3.06	3.00	2.71	17.00
Girls	14	4.64	3.50	2.07	.86	.79	11.86
Younger	18	3.17	3.56	3.00	2.22	1.61	13.56
Older	13	6.08	4.15	2.08	1.77	2.15	16.23
Total	31	4.39	3.81	2.61	2.03	1.84	14.68

RESULTS

Trip Upset Scores

Individual differences. Differences in daily upset scores for individual subjects ranged from zero to thirteen. Total upset scores for all five days ranged from zero to fifty with a median of twelve. As an indication of day-to-day consistency of individual differences in upset scores, the rank-difference correlation (ρ)² was computed between combined scores for Days 1, 3 and 5 and for Days 2 and 4. The coefficient of $+.81$ indicates a relatively high reliability.

Day-to-day changes. Table 1 presents mean upset scores for age and sex subgroups and for the total group of subjects. The table indicates that, for the total group, mean upset scores were lower each succeeding day. Comparing Day 1 with Day 5, twenty-one children had lower scores on Day 5, six had the same score on both days, and four had higher scores on Day 5.

² Woodbury's correction for tied ranks (11) was used in determining all rank-order correlations in this study.

GLEN HEATHERS

The proportion of children with lower scores on Day 5 was significant within the .01 level of confidence.³

Several explanations might be offered to account for the decline in upset scores. To the extent that upset was a function of the novelty of the situation, it should have declined from day to day as the situation became more familiar. Another explanation relates upset to expectancies of positive or negative reinforcements on the trip or in the nursery school. According to this explanation, if the trip to Fels and experiences in the nursery school were predominantly security-giving or pleasurable, expectancies of positive reinforcement would have been established and upset would have lessened with repeated experiences in the situation. Finally, upset responses may be interpreted as attempts to avoid the situation, as when a child cried or clung to its mother in trying to avoid leaving home. Since, in this study, these attempts were unsuccessful, it may be assumed that such control devices would have been used less and less on successive days.

Sex differences. As shown in Table 1, the boys had a considerably higher mean upset score than the girls (17.10 as compared to 11.86). However, this difference was not statistically significant. It is noteworthy that the median upset scores for boys and girls were almost equal (12.0 for the boys and 11.5 for the girls). Also, it should be noted that both subgroups had almost equal upset scores on the first two days' trips. The higher average scores for the boys on Days 3-5 resulted mainly from the high scores of three boys.

Trip upset and intelligence. The correlation (ρ) of total trip upset scores with Binet IQ was $-.17$, an insignificant relationship.

Age Differences in Trip Upset

To determine age differences in upset, the subjects were divided into younger and older subgroups each with an age range of seven months. The eighteen younger children ranged in age from 23.1 to 29.9 months, the thirteen older children, from 30.0 to 37.1 months. Daily and total upset scores for the subgroups are given in Table 1. An unanticipated finding was the markedly greater upset shown by the older group on the first day's trip. The correlation (ρ) between age and upset on Day 1 is $+.38$, significant within the .04 level of confidence.⁴ The reasons for this age difference on the initial trip to nursery school are not apparent. A plausible explanation takes account of the fact that the Fels physical growth and medical examinations are unpleasant for many young children. Since the older children in the present study had been subjected to these examinations

³ The significance of the proportion was determined using the formula $P = \sqrt{pq} / N$.

⁴ The significance of rank-difference correlations was determined using Olds' method (9). Since his Table V includes values for $N=30$ but not for $N=31$, a method of extrapolation was used to determine the approximate values for $N=31$.

CHILD DEVELOPMENT

one or two times more often than the younger children, they had had more opportunities to associate going to Fels with these negatively-reinforcing experiences and so might have been expected to show more upset on the first day's trip to nursery school. Another reasonable explanation of the age differences found on Day 1 follows Shirley's proposal that three-year olds, as compared to children of two or two-and-one-half, have better developed capacities to anticipate situations and to express apprehension regarding prospective experiences (10).

Results for Days 2-5 were consistent with the prediction that older children would show a greater decrease in upset as a result of a given number of experiences in a situation than would younger children. Despite the fact that the older children had almost twice as high a mean upset score as the younger children on Day 1, their total mean score for Days 2-5 (10.15) was almost the same as with the younger children (10.39). On Days 2-5, the correlation (r_{ho}) between age and total upset score was $-.05$.

Trip Upset and Nursery School Behavior

Rank difference coefficients of correlation were calculated for the relationship between trip upset and nine measures of nursery school behavior presumably related to security or inadequacy in social contexts. These were as follows:

<i>Not playing</i> : alone and inactive; usually watching others ⁵	+ .39 *
<i>Social play</i> : structured interaction with child, sharing play materials, conversing, etc. ⁵	-.47 **
<i>Structures child's play</i> : tells other child what to do ⁶	-.32
<i>Interferes with child's play</i> : takes toys from child, blocks his play, etc. ⁶	-.51 ***
<i>Resists child's interference or aggression</i> : complains, struggles, counter-aggresses ⁷	-.38 *
<i>"Passive" dependence on teacher</i> : clings, seeks affection ⁶	+ .14
<i>"Passive" dependence on child</i> : clings, seeks acceptance, not as part of social play ⁶	+ .18
<i>"Assertive" dependence on teacher</i> : seeks attention or approval for accomplishments ⁶	-.19
<i>"Assertive" dependence on child</i> : seeks attention or approval for accomplishments ⁶	-.39 *

(*** designates significant at the .01 level of confidence, ** designates significant at the .02 level of confidence, * designates significant at the .04 level of confidence.)

⁵ Score is proportion of minutes of observation when this variable was noted.

⁶ Score is instances per minute of observation when this variable was noted.

⁷ Score is per cent of instances of interference or aggression by another child to which the child offered resistance.

GLEN HEATHERS

The direction of the relationships shown above support the prediction that trip upset and social insecurity or inadequacy in nursery school play are positively correlated. Children with high trip upset scores were inactive more of the time in the nursery school and engaged in social play less than other children. Also, they tended to show less social assertiveness in the form of structuring other children's play, interfering with other children, and resisting other children's attempts to dominate them.

While only one of the four measures of emotional dependence in nursery school play was significantly related to trip upset, the direction of the correlations with all four variables supports the prediction that upset is associated with "passive" or "infantile" forms of dependence rather than with more "assertive" expressions of dependence in the form of seeking attention or approval.

Trip Upset as Related to Home Influences

Rank difference coefficients expressing the relationship between trip upset and nine variables of home atmosphere or maternal behavior as rated with the Fels Parent Behavior Rating Scales were as follows:

Home Atmosphere

Adjustment of home (well-adjusted—maladjusted)	-.46 **
Discord in the home (conflict—harmony)	+.31
Sociability of family (aggressive—reclusive)	-.18

Maternal Warmth

Affectionateness (affectionate—hostile)	-.25
Direction of criticism (approval—disapproval)	-.12
Acceptance of child (devotion—rejection)	-.29

Maternal Indulgence

General babying (overhelps—withholds help)	+.11
General protectiveness (sheltering—exposing)	-.05
Solicitousness for child's welfare (anxious—nonchalant)	-.13

(** designates correlation significant at the .02 level of confidence.)

The correlations involving the three *home atmosphere* and three *maternal warmth* variables were all in the predicted direction. Adjustment, harmony (non-discord), and sociability of the family all were associated with low upset on the trip to Fels. Also, maternal acceptance, affection and approval were negatively related to trip upset. However, only one of the six correlation coefficients was statistically significant. This was the relationship of $-.46$ between trip upset and *Adjustment of Home* which was significant within the .02 level of confidence.

The three *maternal indulgence* variables—babying, protectiveness and solicitousness—were virtually unrelated to trip upset. This finding is con-

CHILD DEVELOPMENT

sistent with the interpretation offered earlier in this paper that maternal indulgence, as rated on the Fels scales, involves two factors—warmth and restriction of learning experiences—which lead to opposite predictions with respect to trip upset. In fact, each of the indulgence variables was positively correlated with each of the warmth variables, the coefficients (ρ) ranging from $+.28$ to $+.57$. The data of this study were insufficient to permit partialling out the warmth factor in determining the correlation of maternal indulgence with trip upset.

DISCUSSION

The present study must be considered as exploratory because of the small number of cases and the inadequate control of variables which probably affected the children's adjustment on the trip to nursery school.

The check-list method employed to measure adjustment during the trip to nursery school has the advantages of simplicity and objectivity and yielded a good level of day-to-day reliability. The method requires further development through item analysis of the indicators of upset and through determining inter-observer reliability.

Both in Shirley's study and in the present one there was evidence that children of about three years of age show more upset in novel social situations than children of about two-and-a-half years. Shirley proposed that this was because, at about three years of age, children "are beginning to develop anticipation and apprehension" (10, p. 212). This suggestion merits intensive study.

Both in the study reported here with nursery-school children and in the writer's previous study with grade school children, older children adjusted more quickly to novel situations than younger children after the first experience with the situation. The fact that these age differences were not found on the first experience with the situation favors the interpretation of adjustment to novel situations in terms of expectancy theory. On the first trial in a situation, when novelty is maximal, older children cannot apply any advantages they hold over younger children in adjustive capacities since they do not know what to expect in the situation. Such advantages do apply to later experiences with the situation.

This study contributes little toward indicating the sources of individual differences in adjustment to novel situations. The fact that correlations between ratings of home influences and upset scores were generally low and statistically insignificant may be evidence of low validity of the Fels Parent Behavior Rating Scales as predictive instruments. This is a reasonable interpretation, considering that the ratings employing the Fels scales were based on one two-hour period of observing mother and child in the home.

GLEN HEATHERS

Much more extensive observation of home influences would be required to provide adequate data for testing the relations between the child's experiences at home and his behavior in situations outside the home.

SUMMARY

1. This paper reports an exploratory study of the adjustment of thirty-one two-year-old children to the novel experience of being taken from home and mother by an unfamiliar woman and driven to nursery school with other children who were strangers.

2. The children's adjustment during the trip to nursery school was measured by a check-list which included eighteen behavioral items judged to be indicative of upset. Trip upset was measured on each of the first five days the children attended nursery school.

3. Individual upset scores for the five days ranged from zero to fifty. Individual differences in upset were consistent from day to day. Sex and intelligence were not found to be significant factors in upset.

4. There was a reliable decrease in trip upset scores from first to fifth days. Alternative explanations for this decrease were suggested.

5. On the first day's trip, older two-year-olds showed reliably more upset than younger ones. This was interpreted in relation to expectancies of negative reinforcement associated with the trip. On succeeding days, the older children showed a greater decline in upset than the younger ones. This was interpreted as evidence that the older children had greater capacities to adjust to the situation than the younger children, once they had experienced the situation and knew what to expect.

6. The assumption that trip upset was evidence for general social insecurity was supported by positive correlations between trip upset and measures of social inadequacy in nursery school play.

7. Evidence was presented to suggest that harmony of the home, sociability of the family and maternal warmth favored adjustment on the trip to nursery school. However, these findings, except with respect to the variable *Adjustment of Home* were not statistically significant. Maternal indulgence at home, as shown by babying, protectiveness or solicitousness for the child's welfare, did not appear to be related to adjustment on the trip.

REFERENCES

1. ARSENIAN, JEAN M. Young children in an insecure situation. *J. abnorm. soc. Psychol.*, 1943, 38, 225-249.
2. BALDWIN, A. L. The effect of home environment on nursery school behavior. *Child Developm.*, 1949, 20, 49-61.

CHILD DEVELOPMENT

3. BALDWIN, A. L., KALHORN, J., and BREESE, F. H. The appraisal of parent behavior. *Psychol. Monogr.*, 1949, 63, No. 4 (Whole No. 268).
4. BALDWIN, A. L., KALHORN, J., and BREESE, F. H. Patterns of parent behavior. *Psychol. Monogr.*, 1945, 58, No. 5 (Whole No. 299).
5. HEATHERS, GLEN. Emotional dependence and independence in a physical threat situation. *Child Developm.*, 1953, 24, 169-179.
6. HEATHERS, GLEN. Emotional dependence and independence in nursery school play. *J. genet. Psychol.*, in press.
7. LEVY, D. M. *Maternal overprotection*. New York: Columbia Univ. Press, 1943.
8. LIDDELL, H. S. Experimental induction of psychoneuroses by conditioned reflex with stress. In The 27th Annual Conference of the Milbank Memorial Fund, *The biology of mental health and Disease*. New York: Hoeber, 1952. Pp. 498-507.
9. OLDS, E. G. Distribution of sums of squares of rank differences for small numbers of individuals. *Ann. math. Stat.*, 1938, 9, 133-149. (See Table V)
10. SHIRLEY, MARY M. Children's adjustments to a strange situation. *J. abnorm. soc. Psychol.*, 1942, 37, 201-217.
11. WOODBURY, MAX M. Rank correlation where there are equal variates. *Ann. math. Stat.*, 1940, 11, 358-362.

